Retinopathy

OPHTHALMOLOGY

DMO can be treated by selecting cost-effective strategies

Readability	✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

1 Diabetic macular oedema (DMO) is a leading cause of vision loss, occurring in up to a quarter of all individuals with diabetic retinopathy; treatments include focal laser, intravitreal corticosteroids, such as intravitreal triamcinolone (IVTA), and intravitreal anti-vascular endothelial growth factor (anti-VEGF) agents.

2 The author previously examined ways to determine the costs and cost–benefit profiles of treatments for DMO; in this study he applied cost-effectiveness analyses in specific clinical situations where the results of DMO treatments are similar, to consider the economic selection of treatment for some people with DMO.

3 The results of clinical trials of laser, intravitreal corticosteroids and anti-VEGF agents and vitrectomy trials were analysed to determine the visual acuity (VA) saved and cost of therapy for 1 year.

4 Results from specific clinical situations were observed: treatment for DMO causing a VA loss <20/200 showed that IVTA therapy was at least as effective as laser therapy in improving VA; treatment of pseudophakic DMO showed that anti-VEGF agents gave equal visual benefits to laser combined with IVTA therapy; DMO causing a VA loss ≥20/32 has only been treated by laser therapy in studies; treatment for DMO with aflibercept yields equal visual benefits regardless of frequency of treatment.

5 It was concluded that where treatments give equivalent results, choosing the less expensive therapy would save between 39% and 93% of cost without sacrificing clinical benefit.

Smiddy WE (2012) Clinical applications of cost analysis of diabetic macular edema treatments. *Ophthalmology* **119**: 2558–62

Cost-effective treatments for diabetic macular oedema

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Diabetic retinopathy, although largely preventable, has been identified as one of the leading causes of visual impairment in Europe and America, particularly in people of working age. An explosion in the prevalence of diabetes in countries that adopt a Westernised lifestyle means that these countries will experience significant socioeconomic challenges in the future. Laser treatment for proliferative diabetic retinopathy is highly effective if given at the appropriate stage in the disease. However, laser treatment for diabetic maculopathy is less effective, and this has driven the need to find newer treatments. Various oral and intravitreal treatments are now available; intravitreal treatments are relatively expensive compared with laser therapy. Cost–benefit analyses are vital but have usually been considered in isolation; this article seeks to apply cost-effectiveness analyses in the "real world" – "theory in action".

The author of the paper summarised alongside calculated the cost per quality-adjusted life year for 1 year of therapy, including the cost of appointments, investigations and treatment, but not the cost of complications of treatment (notably the cost of glaucoma treatment and cataract extraction in individuals undergoing intravitreal steroid injections). Five practical scenarios were considered: treatment in individuals with poor vision (less than 6/60); treatment in individuals with good vision (6/9 and above); treatment in individuals who had undergone cataract extraction; less frequent dosing regimens; and use of less costly injections.

Evidence from the latest studies has suggested that intravitreal injections are superior to laser treatment in terms of improving vision. Intravitreal steroids have a high complication rate – secondary glaucoma and cataract – and this has been taken as evidence to support the use of intravitreal anti-vascular endothelial growth factor (VEGF) agents as first-line treatment. However, the studies comparing intravitreal agents with laser all excluded patients with good vision. A short course of laser has been shown to stabilise vision effectively and is therefore likely to be more cost-effective than repeated intravitreal injections in individuals with good vision. In individuals with particularly poor vision and those who have undergone cataract surgery, intravitreal steroids appear to confer the most benefit. Finally, the anti-VEGF agent ranibizumab has been most widely studied and has been approved for use in the eye. However, there are alternatives that may be more cost-effective. The use of aflibercept on alternate months, as opposed to monthly, appears to give similar results at a lower cost; the BOLT study (Michaelides et al, 2010) suggested that intravitreal bevacizumab is as effective as ranibizumab, and its use would realise savings of 85%.

This article has shown that savings of between 39% and 93% could be achieved by targeted use of different treatment regimens in certain clinical subgroups of patients, allowing a more pragmatic approach to treatment in times where judicious use of resources is essential.

Michaelides M, Kaines A, Hamilton RD et al (2010) A prospective, randomised trial of intravitreal bevacizumab or laser therapy in the management of diabetic macular oedema (BOLT study): 12-month data. *Ophthalmology* **117**: 1078–86

DIABETES CARE

Retinopathy progress after 20 years is less in recent diagnoses

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓

1 Studies representing two eras of diabetes management were used to compare the prevalence and severity of diabetic retinopathy at 20 years of diabetes duration.

2 Ophthalmic examinations such as fundus photographs were performed at 20 years' duration of diabetes in 305 people during 2007–2011 and in 583 people during 1980–1996.

3 In the more recent cohort, 18% had vision-threatening levels of retinopathy compared with 43% in those diagnosed earlier.

4 Retinopathy severity at 20 years' duration of diabetes was lower in those diagnosed more recently, suggesting improved diabetes care.

LeCaire TJ, Palta M, Klein R et al (2012) Assessing progress in retinopathy outcomes in type 1 diabetes. *Diabetes Care* 27 Nov [Epub ahead of print]

POLISH ARCHIVES OF INTERNAL MEDICINE

RT measured by OCT is higher in people with diabetes

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓

1 Early recognition of diabetic retinopathy (DR) is essential in the prevention of vision loss; the authors compared retinal thickness (RT), retinal nerve fibre layer (RNFL) thickness and ganglion cell layer (GCL) thickness obtained by optical coherence tomography (OCT) in 77 people with T1D, with and without DR, and 31 matched controls.

2 Compared with the control group, people with diabetes had thicker perifoveal retina (P=0.05), mean RNFL (P=0.002), inferior RNFL (P<0.0001) and superior and inferior GCL (P=0.05 and 0.04, respectively).

3 DR was detected in 23 of the people with diabetes (29%); these individuals had thinner parafoveal retina (P=0.05), mean RNFL (P=0.002), inferior and nasal RNFL (P=0.002 and 0.03, respectively) and superior and inferior GCL (P=0.05 and 0.006, respectively) compared with those without DR.

4 RT was higher in people with diabetes but reduced if DR was present; OCT could identify early changes in DR.

Araszkiewicz A, Zozulińska-Ziółkiewicz D, Meller M et al (2012) Neurodegeneration of the retina in type 1 diabetic patients. *Pol Arch Med Wewn* **122**: 464–70

CLINICAL OPHTHALMOLOGY

LASIK may be safe in people with diabetes with tight control and no complications

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓

1 Laser *in situ* keratomileusis (LASIK) is increasingly being requested by people with diabetes for elective vision correction; the study objective was to determine whether diabetes should continue to be a contraindication to this treatment by reviewing existing data on LASIK surgery in people with diabetes.

2 A literature review identified three retrospective analyses and several case reports of the outcomes of LASIK surgery in people with diabetes.

3 Based on the limited literature, it was suggested that LASIK may be a "safe" procedure for people with diabetes with excellent glycaemic control and no ocular or systemic complications.

Simpson RG, Moshirfar M, Edmonds JN, Christiansen SM (2012) Laser *in-situ* keratomileusis in patients with diabetes mellitus: a review of the literature. *Clin Ophthalmol* **6**: 1665–74

ARCHIVES OF OPHTHALMOLOGY

Frequent injections of ranibizumab needed to sustain improved VA in DMO

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

1 In the Ranibizumab for Edema of the Macula in Diabetes 2 (READ-2) study, 126 participants with diabetic macular oedema (DMO) were randomised to receive intraocular injections of ranibizumab (n=42), focal laser therapy (n=42) or a combination of the two treatments (n=42); outcome measures included best-corrected visual acuity (VA).

2 The authors examined the benefit of increased follow-up and treatment with ranibizumab between months 24 and 36 for those participants remaining in the READ-2 study (28 in the ranibizumab group, 22 in the laser group and 24 in the combination group).

3 After month 24, participants were followed up monthly and received ranibizumab if foveal thickness (FTH) was ≥250 µm; main outcome measures were improvement in best-corrected VA and reduction in FTH between months 24 and 36.

4 People in the ranibizumab group showed a mean improvement in best-corrected VA of 10.3 letters at month 36 compared with 7.2 letters at month 24 (P=0.009); mean FTH at month 36 was 282 µm compared with 352 µm at month 24 (P=0.006).

5 Changes in best-corrected VA and FTH in the laser and combination groups were not statistically significant.

6 More aggressive ranibizumab therapy reduced FTH and improved best-corrected VA in the ranibizumab group; more intensive laser therapy may have reduced the need for more frequent ranibizumab injections in the other two groups to control DMO.

Do DV, Nguyen QD, Khwaja AA et al (2012) Ranibizumab for oedema of the macula in diabetes study. *Arch Ophthalmol* 8 Oct [Epub ahead of print]

DIABETES CARE

Low MA turnover predicts lower risk of developing CSMO

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 A prospective observational study was performed to determine the relationship between microaneurysm (MA) turnover using automated analysis of fundus photographs and the development of clinically significant macular oedema (CSMO) in 410 people with type 2 diabetes and non-proliferative diabetic retinopathy.

2 In total, 348 eyes/participants were followed up at baseline, 6 and 24 months (26 of these developed CSMO); HbA_{1c} at baseline and MA turnover at 6 months independently predicted the development of CSMO.

3 MA turnover was 11.2±11.2 in the 26 participants with CSMO and 5.0±5.2 in the remaining 322 (P<0.001); lower MA turn-over predicts a lower risk of CSMO development.

Ribeiro ML, Nunes SG, Cunha-Vaz JG (2012) Microaneurysm turnover at the macula predicts risk of development of clinically significant macular oedema in persons with mild non-proliferative diabetic retinopathy. *Diabetes Care* 30 Nov [Epub ahead of print]