Retinopathy

US still have a long way to go in systematic retinopathy screening

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The overall prevalence of diabetes in Europe is around 4%, approximately half that of the US where over 7% of the population have diabetes and over 8% of those are legally blind due to diabetic retinopathy (DR). In 2005, it was reported that there had been a 14% increase in the prevalence of diabetes over the previous two years (International conference for screening on retinopathy, 2005). In 2006, a series of emotive articles in the *New York Times* highlighted the crisis the city faced, where the percentage of people with diabetes was nearly a third higher than the national average (Kleinfield, 2006a; Kleinfield 2006b).

The need to screen for DR is widely accepted in Europe, although implementation is variable due to a variety of economic and political factors. In 2005, the Liverpool Declaration on Screening for Diabetic Retinopathy in Europe stated that European countries should reduce the risk of visual impairment due to DR by 2010 through the following measures: a systematic programme of screening reaching at least 80% of the population with diabetes; use of trained professionals and personnel; and universal access to laser therapy.

There is no nationwide screening initiative in the US. With a few notable exceptions, screening for DR is performed by ophthalmologists with people being referred for examination at an earlier stage in the disease process than in Europe as per the classification system set out in the Global Diabetic Retinopathy Project (2004).

The US study summarised on the right investigated the uptake of screening in inner-city Nashville. Despite an intensive education and information programme, the demonstrated screening rate was only 23% in 2002. The group then implemented a digital photographic screening programme and offered this as an alternative to attending an ophthalmologic clinic. Forty-one per cent of participants opted for the photographic method. Documented evidence of examination was 31% in the group opting for ophthalmology. The overall documented screening rate was much improved at 59%, but still did not meet European targets.

Given the expected explosion in numbers of people with diabetes and the unacceptable blindness rate, commissioners of health services in the US would do well to consider the wide economic benefits of systematic screening, although this is likely to be resisted by existing providers.

Global Diabetic Retinopathy Project Writing Team (2004) *Classification of Diabetic Retinopathy: A Proposed International Clinical Disease Severity Grading Scale for Diabetic Retinopathy and Diabetic Macular Edema.* Available at: http://www.medscape.com/viewprogram/2600 (accessed 28.08.07)

International conference for screening on retinopathy (2005) *Screening for Diabetic Retinopathy in Europe. 15 years after the St. Vincent Declaration. The Liverpool Declaration 2005*

Kleinfield NR (2006a) Diabetes and Its Awful Toll Quietly Emerge as a Crisis. *The New York Times* 9 January

Kleinfield NR (2006b) Living at an Epicenter of Diabetes, Defiance and Despair *The New York Times* 10 January

EYE

Cumulative 5-year incidence of DR calculated in >49s

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

1 This study utilised data obtained during the Blue Mountains Eye Study; which ran from 1992 to 1994 in Australia. The aim was to determine 5-year incidence and progression of diabetic retinopathy by comparing this data to that collected during 1997–1999.

2 Involved were 2334 people aged >49 years. DR was graded using the modified Early Treatment DR Scale.

3 Cumulative 5-year incidence of DR was 22.2% (95% CI 14.1–32.2%).

4 Progression of DR was found in 25.9% of those with the condition, of which 58.3% showed a progression of >2 steps.

5 Baseline risk factors associated with progression of the condition were fasting blood glucose (OR 1.2; 95% CI 1.1–1.4) and diabetes duration (OR 2.3; 95% CI 1.0–5.3).

Cikamatana L, Mitchell P, Rochtchina E et al (2007) Five-year incidence and progression of diabetic retinopathy in a defined older population: the Blue Mountains Eye Study. *Eye* **21**: 465–71

DIABETES CARE

Digital imaging in primary care improves screening rates in US

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

1 A retrospective cohort study involving 495 people with diabetes over 18 years of age was used to evaluate how digital retinal imaging in primary care impacted upon diabetic retinopathy screening rates.

2 The study took place between 01.09.2003 and 31.08.2004 at the Vine Hill Community Clinic, an inner-city primary care clinic in Nashville, US.

3 Participants were asked to choose whether they wished to receive an ophthalmic referral for diabetic retinopathy screening or a digital retinal imaging assessment at the primary care clinic, which, if positive, would result in a referral to secondary care.

4 Examination of medical records showed that of 40.6% of participants who chose clinic digital imaging, 100% received it. In contrast, 59.4% chose a referral to secondary care but only 3.1.3% of these received it.

5 Overall, the baseline retinal screening rate improved to 59.2% after primary-care photographic screening was offered, compared to 23.0% in 2002. The authors describe this change as 'significant' but do not provide a *P* value.

6 Follow-up status of digitally-screened participants was significantly associated with race: Caucasians were more likely to have a negative outcome than those from other ethnic groups (62.4% versus 44.0%, respectively; $P<0.02$).

7 The authors conclude that use of digital imaging technology in the primary care setting can significantly improve screening rates over the conventional method.

Taylor CR, Merin LM, Salunga AM et al (2007) Improving diabetic retinopathy screening ratios using telemedicine-based digital retinal imaging technology: the Vine Hill study. *Diabetes Care* **30**: 574–8

ARCHIVES OF OPHTHALMOLOGY

ETDRS technique should remain standard for maculopathy treatment

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

1 Compared in this study were the modified Early Treatment Diabetic Retinopathy Study (ETDRS) direct/grid photocoagulation technique and a mild macular grid (MMG) technique.

2 Recruited were 263 individuals with previously untreated diabetic macular oedema (mean age 59 years). Participants were randomly assigned to receive either ETDRS technique (162 eyes) or the MMG technique (161 eyes).

3 Changes in optical coherence tomography measures were obtained at 3, 5, 8 and 12 months post-treatment.

4 In individuals where the initial central subfield was ≥250 µm, the ETDRS treatment gave a significantly greater mean thickness decrease at 12 months than MMG treatment (88 µm versus 49 µm, respectively; $P=0.02$).

5 Compared to the MMG technique, ETDRS gave a significantly greater decrease in: weighted inner zone thickening (49 versus 88 µm, respectively; $P=0.04$); maximal retinal thickening (42 versus 28 µm, respectively; $P=0.01$); and retinal volume (0.8 versus 0.4 mm^3, respectively; $P=0.03$).

6 Using this evidence, the authors arrived at the conclusion that the MMG technique is less effective than the ETDRS technique and that ETDRS should remain the standard approach to diabetic macular oedema treatment.

Writing Committee for the Diabetic Retinopathy Clinical Research Network, Fong DS, Strauber SF et al (2007) Comparison of the modified Early Treatment Diabetic Retinopathy Study and mild macular grid laser photocoagulation strategies for diabetic macular edema. *Archives of Ophthalmology* **125**: 469–80

BRITISH JOURNAL OF OPHTHALMOLOGY

Advantages of posterior subtenon TA injection

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

1 This paper evaluated the efficacy of subtenon injection of triamcinolone acetone (TA) prior to laser grid pattern photocoagulation (G-PC) in diffuse diabetic macular oedema.

2 Twenty-one eyes received a posterior TA subtenon injection 1 week prior to G-PC and results were compared in 21 control eyes.

3 One week after TA injection foveal thickness was significantly reduced in TA injected eyes ($P<0.001$, however at 12 weeks there was no statistically significant difference in VA between TA injected eyes and control eyes.

4 The authors concluded that TA injections allowed significantly lower powered laser treatment ($P<0.001$).

Shimura M, Nakazawa T, Yasuda K et al (2007) Pretreatment of posterior subtenon injection of triamcinolone acetonide has beneficial effects for grid pattern photocoagulation against diffuse diabetic macular oedema. *British Journal of Ophthalmology* **91**: 449–54

OPHTHALMIC EPIDEMIOLOGY

DR found in 50% of people with type 2 diabetes of <5 years duration

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

1 Between 2003 and 2005, 217 people with type 2 diabetes were recruited to this study investigating screening coverage and prevalence of diabetic retinopathy in a diabetes centre in Spain.

2 Mean age of participants was 60.9 years; mean duration of diabetes was 7 years.

3 A longer duration of type 2 diabetes was significantly correlated with the level of screening coverage ($P=0.001$).

4 Within the first 5 years of diagnosis, 50% of study participants had developed some form of retinopathy; however, only 26.1% had received any previous fundus examination.

5 The authors argue that these results support the use of screening programmes aimed at people who have been diagnosed with type 2 diabetes for less than 5 years.

Soto-Pedre E, Hernaez-Ortega MC, Piniés JA (2007) Duration of diabetes and screening coverage for retinopathy among patients with type 2 diabetes. *Ophthalmic Epidemiology* **14**: 76–9

INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE

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

Computers equal to experts in identifying early DR

1 In this study, the performance of a computer programme for identifying and differentiating between drusen exudates and cotton-wool spots was compared to that of three retinal experts.

2 Three hundred retinal images were used; 100 of which contained previously-diagnosed bright lesions.

3 In 87% of cases, the automated system returned the same outcome in terms of presence and type of lesion as the three specialists.

4 The authors highlight the use of digital 2-field nonstereo photography as a key limitation – the standard in research practice is 7-field stereo fundus photography.

5 With further improvements the authors predict that the system has the potential to assist in the prevention of visual loss in people with diabetes.

Niemeijer M, van Ginneken B, Russell SR et al (2007) Automated detection and differentiation of drusen, exudates, and cotton-wool spots in digital color fundus photographs for diabetic retinopathy diagnosis. *Investigative Ophthalmology & Visual Science* **48**: 2260–7

'ETDRS should remain the standard approach to diabetic macular oedema treatment.'

'Within the first 5 years of diagnosis, 50% of study participants had developed some form of retinopathy'