DEJ
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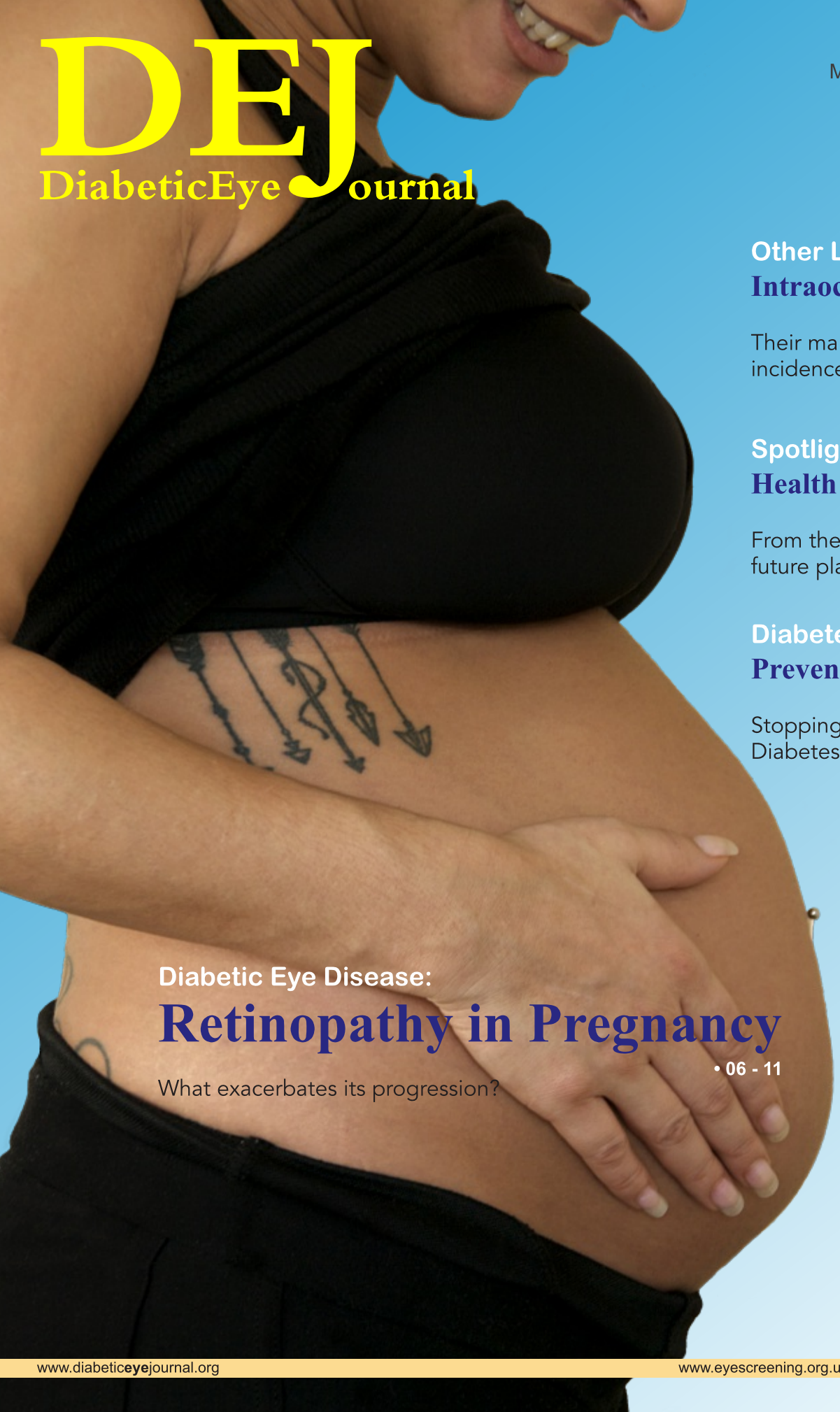

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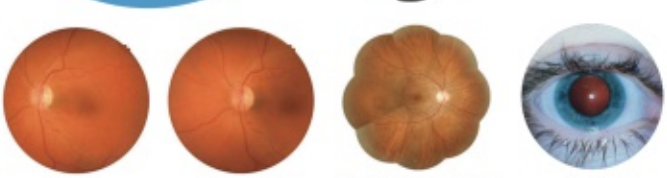

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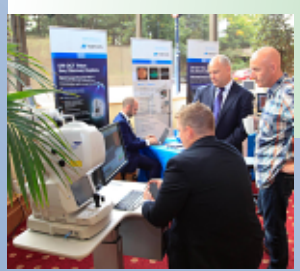

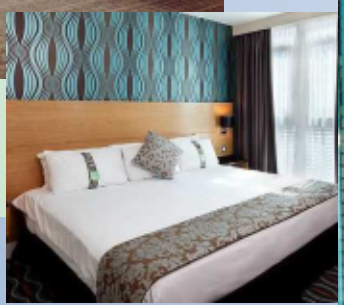

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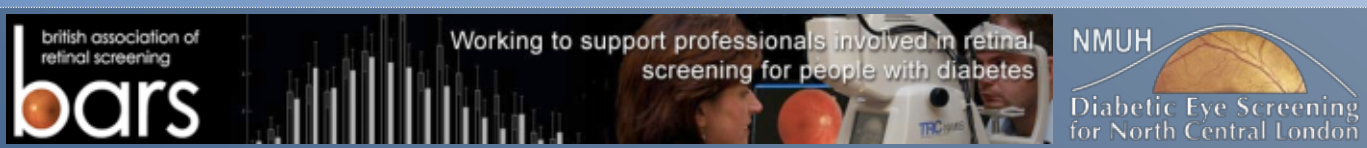

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Courses

Training Courses at Retinopathy Screening Centre, Heartlands Hospital, Birmingham
Advanced DR Grader Course: 04 to 06 April 2016
DR Grader Course: 10 to 14 October 2016
To register: *www.retinalscreening.co.uk*

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Venue: Holiday Inn Birmingham City Centre
To register: *www.eyescreening.org.uk*

National DES Conference 2016
Friday 22nd of April 2016
Venue: Royal Society of Medicine
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To find out more: *www.rsm.ac.uk/events*

Imaging of the eye
Thursday 12th of May 2016
Venue: Royal Society of Medicine
1 Wimpole Street, LONDON W1G 0AE
To find out more: *www.rsm.ac.uk/events*

LESF (London Eye Screening Forum)
08th of June 2016
Venue: To be confirmed, London
To find out more:
https://www.northmid.nhs.uk/Diabetic-eye-screening-services/About-diabetic-eye-screening-services

EASDec (Eye Complication Study Group) Meeting
23 to 25 June 2016
Venue: Manchester, UK
To find out more: *www.easdec.org/pages/*

EASD (European Association for the study of Diabetes) Meeting
12 to 16 September 2016
Venue: Munich, Germany
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DiabeticEyeJournal

FROM THE EDITOR

Welcome to our March issue of DEJ. When deciding on the contents for each issue we always try to resource new and relevant topics that readers might come across in daily practice. Apart from that we like to add a little bit of humour, something new, something up to date creating a mixture to catch your eye and also stimulate your brain.

Diabetic Retinopathy in Pregnancy is a hot topic, not only beacause patients become part of the Digital Surveillance pathway which most Diabetic Eye Screening programmes were adapting to not that long ago; but also because of the exacerbation in retinopathy which can pose a threat to the vision of pregnant women. Dr Kevin Shotliff and his colleague Dr Anjali Zalin from Chelsea and Westminster Hospital explore this field in greater detail in the section on Diabetic Eye Disease.

In the section on Other Lesions we delve deeper into the varieties and malignancy of Intraocular Tumours. Mr Mandeep S. Sagoo and Mr Didi Fabian from MEH and UCL Institute of Ophthalmology provide an overview and possible treatments of these malignant and non-malignant lesions.

Diabetes UK, NHS England and Public Health England are joining forces in the Prevention of Type 2 Diabetes. Can this be the solution to a global problem? Read about the ideas and pilot programmes which are already up and running around the Country.

Enjoy our Spring issue and don't forget to submit interesting case studies and articles - you might be suprised, it may just appear in a future edition. To receive a free copy of this Journal join BARS - our publisher.

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EDITOR

Iveta Olejkova NCL - NMUH

PUBLISHER BARS

COVER IMAGE DR in Pregnancy

PRODUCTION TEAM

Grant Duncan Chairman of BARS

Jacqueline Mansell

Phil Gardner Deputy Chair of BARS

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COMMENTS and CONTRIBUTIONS

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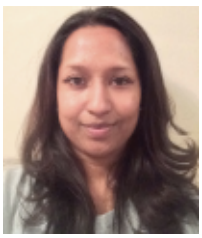
Diabetic Retinopathy in Pregnancy



Dr Anjali Zalin and **Dr Kevin Shotliff** Consultant Physicians
from Beta Cell Diabetes Centre at Chelsea and Westminster
Hospital in Fulham Road, London

Physiological Changes in Pregnancy

A healthy pregnancy is associated with a number of anatomical and physiological changes, particularly to the cardiovascular system (Rubler, Damani, & Pinto, 1977). Changes in heart rate and stroke volume contribute to a 30-50% increase in cardiac output (Clark et al., 1989), evident by the end of the 1st trimester (Capeless & Clapp, 1991). Augmented plasma volume and decreased peripheral resistance (Clark et al., 1989) further contribute to increased blood flow throughout the body, and particularly to the gravid uterus and kidneys (Costantine, 2014; Frederiksen, 2001).

Whilst auto regulatory processes typically maintain normal retinal blood flow during a healthy pregnancy, doppler velocimetry studies have demonstrated that retinal blood flow increases in women with diabetes who develop progression of retinopathy. This phenomenon was not demonstrated in pregnant women with stable diabetic retinopathy (Chen et al., 1994). Hyperglycaemia in its own right is also known to alter this autoregulation in retinal vessels, so potentially exacerbating any detrimental effect of the increased blood flow seen in pregnancy.

It is not clear whether this increase in blood flow causes worsening retinopathy or is, in fact, an epiphenomenon: an appropriate compensatory mechanism to local hypoxia and coincidentally progressive retinopathy (Best & Chakravarthy, 1997).

Risk Factors for Progression of Diabetic Retinopathy in Pregnancy

A number of studies have demonstrated that diabetic retinopathy frequently deteriorates during pregnancy (R. Klein, Klein, Moss, Davis, & DeMets, 1984; Moloney & Drury, 1982). Various factors have been implicated (Best & Chakravarthy, 1997) and are described in more detail below.

The severity of baseline retinopathy at the time of the conception has been shown to be of importance. A small proportion of women (12%) with no retinopathy develop minor background changes which typically regress in the postpartum period (Sunness, 1988). In contrast, microaneurysms developing in the context of mild background retinopathy may not regress to preconception levels (Soubrane, Canivet, & Coscas, 1985). Finally, women with moderate baseline retinopathy have been shown to develop proliferative changes more frequently (29%) than those with less severe retinopathy (6.3%) (Chew et al., 1995).

It is well established that an individual's duration of diabetes is strongly associated with their degree of retinopathy (R. Klein et al., 1984). Duration of disease has also been shown to be associated with the development of more severe retinal changes during pregnancy, with progression to proliferative levels in 39% of people with over 15 years of diabetes compared to 18% of patients with a disease duration of under 15 years (Best & Chakravarthy, 1997; Chew et al., 1995).

Glycaemic control is another important factor in the progression of diabetic retinopathy in pregnancy. Several studies, including the Diabetes in Early Pregnancy Study (DIEP), have shown that women with the highest initial HbA1c values, as well as the greatest HbA1c reduction in the first 14 weeks of pregnancy, are at increased risk for progression of retinopathy (Best & Chakravarthy, 1997; Chew et al., 1995).

Finally, hypertension, an established risk factor for progression of retinopathy (R. Klein et al., 1984) has also been studied in pregnancy. In women with diabetes and hypertension, 50% of those with hypertension (chronic and/or pregnancy induced) developed progression of retinopathy compared to only 25% who did not have hypertension (Rosenn et al., 1992).

General Preconception Aims in Women with Diabetes

Of the 700 000 women who give birth in England and Wales each year, 5% have diabetes mellitus. The majority of this group (87.5%) are diagnosed with Gestational Diabetes Mellitus (GDM) during pregnancy (see **table 1** for diagnostic criteria), whilst the remainder of this group have pre-existing diabetes: 7.5% type 1 and 5% Type 2 (NICE, 2015).

	EPG (mmol/L)	2 hr glucose (mmol/L)
GDM	≥5.6 mmol/L	≥7.8 mmol/L
Normal glucose tolerance	<5.6 mmol/L	<7.8 mmol/L

Table 1: Diagnostic criteria for Gestational Diabetes Mellitus (NICE, 2015)

For women of childbearing age with pre-existing diabetes, clear information, which should ideally be provided and reinforced prior to conception, may facilitate positive pregnancy outcomes and experiences. Early discussions and routine preconception advice to all women of childbearing age are particularly important given that approximately half of pregnancies in the UK are unplanned (Wellings et al., 2013).

Women should be supported to achieve appropriate, evidence-based preconception targets and counselled as to the benefits in doing so. Modifications to care should occur as part of a collaborative process between the patient and the multidisciplinary team.

Current NICE guidelines highlight a number of important areas to cover. These are outlined in **table 2** (NICE, 2015).

Area	Topics to discuss
Education	Contraception until health is optimised How diabetes affects pregnancy and vice versa Hypoglycaemia and impaired awareness How adverse outcomes may be minimised Need for close monitoring of retinopathy & complications Lifestyle advice especially if BMI >27 kg/m^2 Structured education programme for women with Type 1 Diabetes
Glycaemia	Advise same glucose targets as for those with Type 1 Diabetes: • fasting plasma glucose levels of 5–7mmol/L • random plasma glucose levels of 4–7 mmol/L Reiterate sick day rules Offer monthly HbA1c testing and discuss individualised targets Aim HbA1c <48 mmol/mol if achievable without hypoglycaemia
Medications	Advise 5mg/day of Folic Acid until 12 weeks of gestation Continue metformin therapy if prescribed Substitute insulin for all other oral antihypoglycaemic agents Use isophane/NPH as first choice long-acting insulin Stop ACE inhibitors and statins
Retinal screening	Offer retinal assessment to women seeking preconception care at first visit (not required if annual retinal assessment has occurred in the last 6 months) Offer annual retinal assessment if no retinopathy is found prior to pregnancy *'Carry out retinal assessment by digital imaging with mydriasis using tropicamide, in line with the UK National Screening Committee's recommendations for annual mydriatic 2-field digital photographic screening as part of a systematic screening programme.'*(NICE, 2015) Advise women not to proceed with rapid optimisation of blood glucose until after retinal assessment and treatment
Renal assessment	Perform preconception renal assessment and refer to nephrologist if: Urinary albumin:creatinine ratio >30mg/mmol Estimated glomerular filtration rate <45 ml/minute/1.73m^2 Serum creatinine is abnormal (120 micromol/litre or more)

Table 2: Summary of preconception care for women with diabetes mellitus (NICE 2015)

Abbreviations: HbA1c (glycosylated haemoglobin), NPH (Neutral Protamine Hagedorn), ACE (Angiotensin converting enzyme)

Retinal Assessment During & After Pregnancy

Following on from the advice regarding preconception assessment outlined in **table 2**, newly pregnant women with diabetes should also be offered retinal assessment at their first antenatal clinic appointment (unless they have had a retinal assessment in the last 3 months), and then again at 28 weeks. Retinopathy progresses in up to 85% of women with diabetes who become pregnant (Chew et al., 1995; DCCT, 2000), and so, for those found to have retinopathy, an additional retinal assessment should be performed at 16-20 weeks (NICE, 2015). Frequent monitoring is particularly important given that rapidly progressive retinopathy may be asymptomatic.

Sight threatening retinopathy detected on screening requires ophthalmological input, as it would outside pregnancy. Women with GDM are not at increased risk for the development of diabetic retinopathy and do not need such monitoring.

At term, diabetic retinopathy should not be considered a contraindication to vaginal birth. Following birth, it is important to ensure that women with any form of referable retinopathy have ophthalmological follow-up for at least 6 months post-partum (NICE, 2015).

Regardless of the short-term fluctuations in retinal status observed during pregnancy, a number of studies suggest that there are no long-term unfavourable effects of pregnancy on diabetic retinopathy (B. E. K. Klein & Klein, 1984). When groups of diabetic women who had/had not experienced pregnancy were compared over 6.5 years, no difference in the severity of retinopathy was seen between the groups (DCCT, 2000). It has been suggested that intensive glycaemic control as is often implemented during pregnancy may, in fact, have a protective effect. The exception is macular oedema which may persist postpartum and lead to visual loss (Best & Chakravarthy, 1997).

In terms of methods of retinal assessment during pregnancy, the data on fluorescein angiography is limited. One survey of 399 specialists did not report an increased rate of birth anomalies or pregnancy-related complications with its use in pregnancy although it was not used by the majority (78%) of specialists questioned (Olk, Halperin, Soubrane, & Coscas). Postpartum, the excretion of fluorescein in breast milk is an important consideration (Mattern & Mayer, 1990).

Optical coherence tomography (OCT) has gained popularity in the diagnosis and monitoring of macular oedema. It is not currently suggested as a replacement for fluorescein angiography (Dmuchowska, Krasnicki, & Mariak, 2014), although this may change in the future with advancements in the field.

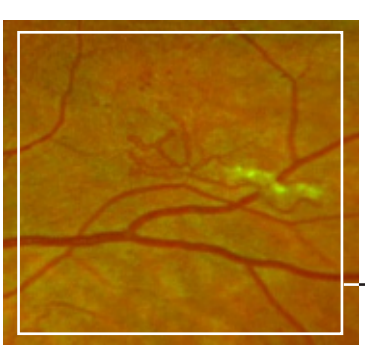
Fundus Changes Seen in Diabetic Retinopathy During Pregnancy

Changes seen during pregnancy are not dissimilar to those seen outside of pregnancy. Some changes are, however, reported to occur at increased frequency. These include cotton wool spots or soft exudates, thought to be associated with hypoglycaemia and rapidly improving control as in the non-pregnant individual (Moloney & Drury, 1982), and haemorrhages and microaneurysms (Phelps, Sakol, Metzger, Jampol, & Freinkel, 1986).

Treatment of Diabetic Retinopathy in Pregnancy

Prior to the advent of laser photocoagulation, women with proliferative retinopathy were advised to consider termination of pregnancy in view of the significant risk of visual loss (White, 1974).

With prompt and appropriate administration of laser therapy, prognosis has improved substantially (Best & Chakravarthy, 1997). The current indications for laser treatment are the same as for other (non-pregnant) people with diabetes (Hercules, Wozencroft, Gayed, & Jeacock, 1980). There are, however, a number of special considerations. Firstly, given that some studies have demonstrated postpartum regression of retinopathy (Serup, 1986), there is a case for performing a limited photocoagulation procedure (Best & Chakravarthy, 1997). It is also worth considering that in some women, retinopathy progresses more aggressively and may not respond well to photocoagulation (Conway, Baldwin, Kohner, Schulenburg, & Cassar, 1991). Ideally, all patients with proliferative retinopathy should therefore be identified and treated prior to conception (Best & Chakravarthy, 1997).



NVE - Type 1 Diabetic pregnant patient.

Special consideration should also be given to women who develop macular oedema during pregnancy (Sinclair, Nesler, Foxman, Nichols, & Gabbe, 1984). Laser therapy may be used in this context but can exacerbate oedema. Alternative therapeutic options including salt restriction may need to be considered (Best & Chakravarthy, 1997).

Glycaemic control forms another important arm in the management of diabetic retinopathy during pregnancy. Current guidelines recommend retinal assessment prior to any rapid improvement in glycaemic control (NICE, 2015). Whilst this is clearly prudent given that rapid fluctuations may contribute to short-term deterioration in retinopathy (Chew et al., 1995), it is also important to consider that improved glycaemic control is reported to confer an overall benefit with a reported 50% reduction in retinopathy at 2 years of follow-up (DCCT, 1993, 1995).

Other treatment options during pregnancy include vitreous surgery which is safe to perform in pregnancy if indicated. There are currently no randomized studies examining intravitreal injections of anti-vascular endothelial growth factor (VEGF) agents during pregnancy. Case studies with small numbers of patients have reported mixed findings ranging from no adverse pregnancy outcomes (Tarantola, Folk, Boldt, & Mahajan, 2010) to early pregnancy loss (Petrou et al., 2010). Women of childbearing age for whom this therapy is considered should therefore be counselled as to the lack of safety evidence in this area.

Finally, a number of studies have shown that as the severity of baseline diabetic retinopathy increases, adverse obstetric outcomes are reported with increasing frequency (B. E. Klein, Klein, Meuer, Moss, & Dalton, 1988; Price, Hadden, Archer, & Harley, 1984). One study of n=179 women reported that 43% of the women with proliferative retinopathy had an unfavourable obstetric outcome compared with 13% of those without proliferative retinopathy. Adverse outcomes included congenital malformation and fetal death (B. E. Klein et al., 1988). This highlights the importance of effective preconception and antenatal care.

Case Study

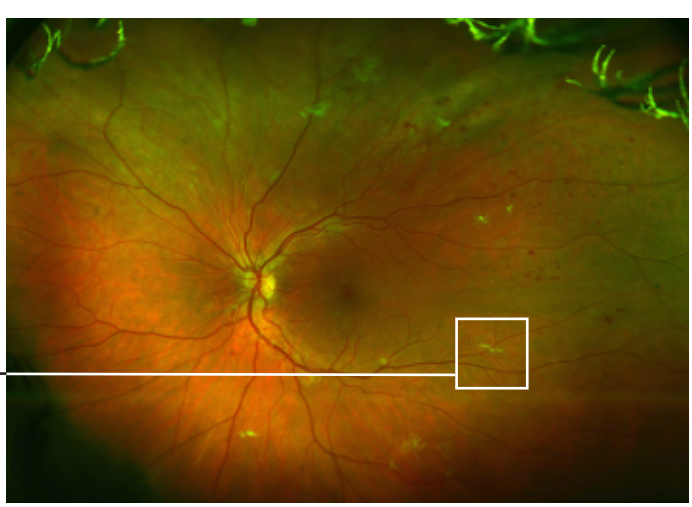
A 32 year old woman is in a casual relationship. She has had Type 1 diabetes since the age of 13. Preceding glycaemic control has been suboptimal and she is regularly admitted to the local hospital for diabetes related illnesses associated with non-compliance of therapy. Unusually she attends for her retinal screening appointment today and mentions that she is 12 weeks pregnant. You find evidence of proliferative retinopathy.

Discussion Points:

What are the priorities in her management?

When should she be asked to return for a repeat retinal assessment?

Are there any other specialists who should ideally be involved in her care at this point



Key Points

- Diabetic retinopathy frequently progresses in pregnancy
- There are a number of identifiable risk factors for progression of retinopathy although not all are amenable to modification
- Preconception care forms a cornerstone of treatment and ideally, glycaemic control and proliferative retinopathy should be optimised/treated prior to conception
- A tailored programme of follow-up should be offered to every pregnant woman with diabetic retinopathy with frequency of assessment based on national guidelines and considering severity and rate of progression of retinopathy
- Laser photocoagulation therapy is safe in pregnancy and performed for the same indications as in non-pregnant patients with diabetes
- Women should be reassured that their long-term risk of retinopathy progression is not affected by pregnancy

Images by Natalie Cook, Ophthalmic Photographer at RFH NHS Trust.

References

Best, R. M., & Chakravarthy, U. (1997). Diabetic retinopathy in pregnancy. British Journal of Ophthalmology, 81(3), 249–251. doi:10.1136/bjo.81.3.249

Capeless, E. L., & Clapp, J. F. (1991). When do cardiovascular parameters return to their preconception values? American Journal of Obstetrics and Gynecology, 165(4 Pt 1), 883–6. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1951547

Chen, H. C., Newsom, R. S., Patel, V., Cassar, J., Mather, H., & Kohner, E. M. (1994). Retinal blood flow changes during pregnancy in women with diabetes. Investigative Ophthalmology & Visual Science, 35(8), 3199–208. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/8045714

Chew, E. Y., Mills, J. L., Metzger, B. E., Remaley, N. A., Jovanovic-Peterson, L., Knopp, R. H., … Aarons, J. H. (1995). Metabolic Control and Progression of Retinopathy: The Diabetes in Early Pregnancy Study. Diabetes Care, 18(5), 631–637. doi:10.2337/diacare.18.5.631

Clark, S. L., Cotton, D. B., Lee, W., Bishop, C., Hill, T., Southwick, J., … Phelan, J. (1989). Central hemodynamic assessment of normal term pregnancy. American Journal of Obstetrics and Gynecology, 161(6 Pt 1), 1439–42. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/2603895

Conway, M., Baldwin, J., Kohner, E. M., Schulenburg, W. E., & Cassar, J. (1991). Postpartum progression of diabetic retinopathy. Diabetes Care, 14(11), 1110–1. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1797501

Costantine, M. M. (2014). Physiologic and pharmacokinetic changes in pregnancy. Frontiers in Pharmacology, 5, 65. doi:10.3389/fphar.2014.00065

DCCT. (1993). The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. The Diabetes Control and Complications Trial Research Group. The New England Journal of Medicine, 329(14), 977–86. doi:10.1056/NEJM199309303291401

DCCT. (1995). The Effect of Intensive Diabetes Treatment on the Progression of Diabetic Retinopathy in Insulin-Dependent Diabetes Mellitus. Archives of Ophthalmology, 113(1), 36. doi:10.1001/archopht.1995.01100010038019

DCCT. (2000). Effect of pregnancy on microvascular complications in the diabetes control and complications trial. The Diabetes Control and Complications Trial Research Group. Diabetes Care, 23(8), 1084–91. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2631985&tool=pmcentrez&rendertype=abstract

Dmuchowska, D. A., Krasnicki, P., & Mariak, Z. (2014). Can optical coherence tomography replace fluorescein angiography in detection of ischemic diabetic maculopathy? Graefe's Archive for Clinical and Experimental Ophthalmology = Albrecht von Graefes Archiv Fuïr Klinische Und Experimentelle Ophthalmologie, 252(5), 731–8. doi:10.1007/s00417-013-2518-x

Frederiksen, M. C. (2001). Physiologic changes in pregnancy and their effect on drug disposition. Seminars in Perinatology, 25(3), 120–3. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11453606

Hercules, B. L., Wozencroft, M., Gayed, I. I., & Jeacock, J. (1980). Peripheral retinal ablation in the treatment of proliferative diabetic retinopathy during pregnancy. British Journal of Ophthalmology, 64(2), 87–93. doi:10.1136/bjo.64.2.87

Klein, B. E. K., & Klein, R. (1984). GRAVIDITY AND DIABETIC RETINOPATHY. Am. J. Epidemiol., 119(4), 564–569. Retrieved from http://aje.oxfordjournals.org/content/119/4/564.abstract?ijkey=bdc0323a9a0101c617bb80aa60a7751ec479c8a3&keytype2=tf_ipsecsha

Klein, B. E., Klein, R., Meuer, S. M., Moss, S. E., & Dalton, D. D. (1988). Does the severity of diabetic retinopathy predict pregnancy outcome? The Journal of Diabetic Complications, 2(4), 179–84. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/2976761

Klein, R., Klein, B. E., Moss, S. E., Davis, M. D., & DeMets, D. L. (1984). The Wisconsin epidemiologic study of diabetic retinopathy. III. Prevalence and risk of diabetic retinopathy when age at diagnosis is 30 or more years. Archives of Ophthalmology (Chicago, Ill. : 1960), 102(4), 527–32. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/6367725

Mattern, J., & Mayer, P. R. (1990). Excretion of fluorescein into breast milk. American Journal of Ophthalmology, 109(5), 598–9. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/2333925

Moloney, J. B., & Drury, M. I. (1982). The effect of pregnancy on the natural course of diabetic retinopathy. American Journal of Ophthalmology, 93(6), 745–56. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/6178293

NICE. (2015). Diabetes in Pregnancy: Management from the preconception to the postnatal period. Retrieved December 23, 2015, from http://www.nice.org.uk/guidance/ng3/resources/diabetes-in-pregnancy-management-of-diabetes-and-its-complications-from-preconception-to-the-postnatal-period-51038446021

Olk, R. J., Halperin, L. S., Soubrane, G., & Coscas, G. Fluorescein angiography--is it safe to use in a pregnant patient? European Journal of Ophthalmology, 1(2), 103–6. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1821200

Petrou, P., Georgalas, I., Giavaras, G., Anastasiou, E., Ntana, Z., & Petrou, C. (2010). Early loss of pregnancy after intravitreal bevacizumab injection. Acta Ophthalmologica, 88(4), e136. doi:10.1111/j.1755-3768.2009.01572.x

Phelps, R. L., Sakol, P., Metzger, B. E., Jampol, L. M., & Freinkel, N. (1986). Changes in diabetic retinopathy during pregnancy. Correlations with regulation of hyperglycemia. Archives of Ophthalmology (Chicago, Ill. : 1960), 104(12), 1806–10. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/3789980

Price, J. H., Hadden, D. R., Archer, D. B., & Harley, J. M. (1984). Diabetic retinopathy in pregnancy. British Journal of Obstetrics and Gynaecology, 91(1), 11–7. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/6362712

Rosenn, B., Miodovnik, M., Kranias, G., Khoury, J., Combs, C. A., Mimouni, F., … Lipman, M. J. (1992). Progression of diabetic retinopathy in pregnancy: association with hypertension in pregnancy. American Journal of Obstetrics and Gynecology, 166(4), 1214–8. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1566772

Rubler, S., Damani, P. M., & Pinto, E. R. (1977). Cardiac size and performance during pregnancy estimated with echocardiography. The American Journal of Cardiology, 40(4), 534–40. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/910718

Serup, L. (1986). Influence of pregnancy on diabetic retinopathy. European Journal of Endocrinology, 113(3 Suppl), S122–S124. doi:10.1530/acta.0.111S0122

Sinclair, S. H., Nesler, C., Foxman, B., Nichols, C. W., & Gabbe, S. (1984). Macular edema and pregnancy in insulin-dependent diabetes. American Journal of Ophthalmology, 97(2), 154–67. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/6696026

Soubrane, G., Canivet, J., & Coscas, G. (1985). Influence of pregnancy on the evolution of background retinopathy. International Ophthalmology, 8(4), 249–255. doi:10.1007/BF00137653

Sunness, J. S. (1988). The pregnant woman's eye. Survey of Ophthalmology, 32(4), 219–38. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/3279558

Tarantola, R. M., Folk, J. C., Boldt, H. C., & Mahajan, V. B. (2010). Intravitreal bevacizumab during pregnancy. Retina (Philadelphia, Pa.), 30(9), 1405–11. doi:10.1097/IAE.0b013e3181f57d58

Wellings, K., Jones, K. G., Mercer, C. H., Tanton, C., Clifton, S., Datta, J., … Johnson, A. M. (2013). The prevalence of unplanned pregnancy and associated factors in Britain: findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). The Lancet, 382(9907), 1807–1816. doi:10.1016/S0140-6736(13)62071-1

White, P. (1974). Diabetes mellitus in pregnancy. Clinics in Perinatology, 1(2), 331–47. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/4620153

Let's get behind the NHS Diabetes Prevention Programme

The number of people in the UK with diabetes has topped 4 million for the first time. Therefore prevention of Type 2 diabetes has never been more important. For the retinal screening community, prevention could mean a welcome reduction in workload that could allow more attention to those at risk of sight loss from diabetes. **Louise Ansari**, Director of Prevention at Diabetes UK and member of the NHS Diabetes Prevention Programme Management Group, explains how the programme is developing and how the charity is playing a major role.

Figures recently published by the National Cardiovascular Intelligence Network show that as many as 5 million people in England are at high risk of developing Type 2 diabetes.

It was a timely reminder of the importance of the NHS Diabetes Prevention Programme (NHS DPP), which was first announced in the Five Year Forward View in 2014 and which has been under development over the last 12 months.

This ambitious programme is a joint commitment from NHS England, Public Health England and Diabetes UK, to deliver, at scale, evidence-based behavioural interventions for individuals identified as being at high risk of developing Type 2 diabetes. Our aim is to reduce people's risk of developing the condition, and relieve the health system of a major financial burden, both in reducing costs of day-to-day diabetes management, but also potentially reducing the much higher costs of managing complications, such as limb amputation.

Setting the scene

As readers of ***DEJ*** are only too well aware, diabetes is a leading cause of preventable sight loss in people of working age. It is also a major contributor to kidney failure, heart attack, and stroke, and is responsible for 135 amputations in England each week. As well as the human cost, Type 2 diabetes costs the NHS £8.8bn every year, almost 9 per cent of its budget and, if we don't get better at helping people to reduce their risk of developing the condition, these figures threaten to rise to unsustainable levels.

Ninety per cent of people with diabetes have Type 2, which is largely preventable. The NHS DPP will be available across England, offering individuals who are identified as at high risk of Type 2 diabetes, through an NHS Health Check, existing data on a GP practice register or other means, a place on an evidence-based behavioural intervention.

By investing in prevention, and stopping or delaying people getting Type 2 diabetes, we have a real opportunity to reduce costs further down the pathway of care. The risk factors for Type 2 diabetes are also risk factors for other serious conditions like cardiovascular disease, so helping people reduce their risk of Type 2 diabetes will also reduce their risk of other serious illness.

What's the evidence that this will work?

The NHS DPP is the first national diabetes prevention programme delivered at scale – but it is based on models of successful programmes and trials. A comprehensive review of the evidence, commissioned by Public Health England, was published last year. This review provides the most up to date evidence available regarding effectiveness of diabetes prevention programmes targeting high-risk groups, and it supports the proposition from controlled clinical trials that such interventions can be effective. The review shows that programmes similar to the NHS DPP can be successful in preventing 26 per cent of people at high risk of Type 2 diabetes from going on to develop the condition at 12-18 months.

The programme's Expert Reference Group used the evidence review, alongside National Institute for Health and Care Excellence guidelines, to draft a service specification for the NHS DPP intervention, which was subject to a consultation over the summer with the public, healthcare professionals and potential providers. Alongside the review of the evidence, seven demonstrator sites have started introducing new services or expanding their existing services, and their practical experience will also ensure the final service specification and implementation for the programme is as effective as possible.

How will the programme help people reduce their risk?

Based on the evidence, the NHS DPP behavioural intervention will be underpinned by three core goals:

- weight loss
- achievement of dietary recommendations
- achievement of physical activity recommendations.

While the intervention will need to meet local needs of participants, to be effective we know it will be need to be long term, made up of at least 13 sessions, spread across a minimum of nine months. As well as providing information and advice about Type 2 diabetes, dietary change and physical activity, there will be a strong behaviour change element to the intervention so that participants will be supported to set and achieve goals, and establish sustainable behaviour change.

It is likely that sessions will be delivered predominantly in groups and will be 'face-to-face', although there will be an opportunity to trial innovative and novel ways to engage people in the programme.

Eligibility and referral

The NHS DPP will be available to anyone over 18 identified as having non-diabetic hyperglycaemia, defined as having an HbA1c 42 – 47 mmol/mol or a fasting plasma glucose of 5.5 – 6.9 mmol/l. This reading puts them at the highest risk of developing Type 2 diabetes. It has not been designed as a screening programme; rather, it will be available for those already identified to have non-diabetic hyperglycaemia.

It is anticipated that individuals would be referred into the programme via two main mechanisms:

- Identification by GP surgeries through standard clinical practice and/or maintenance of a register of patients at high risk of Type 2 diabetes.
- The NHS Health Check programme, through which patients at risk are identified through the diabetes filter.

We are considering a role for opportunistic and outreach work to widen access to the programme through the use of a validated risk score in community settings, or through encouraging individuals to find out their own level of risk online. Those identified as at risk would then be encouraged or invited for a blood test, to check their eligibility for the programme.

Programme availability at present

We know that in many areas there is a lack of availability of behavioural interventions for GPs to refer into, and that the capacity of these services also varies. For the initial phase of the programme NHS England will commission and fund the NHS DPP nationally, making best use of national purchasing power, ensuring services are available across the country, are implemented at pace and are consistent with the evidence base.

Implementation of the programme will be iterative, with integrated evaluation and ongoing adaptation to ensure that the programme reaches those who need it most and to maximise effectiveness.

The NHS DPP is being designed across three phases, designed to develop the evidence in a staged way:

Pre-procurement phase – working with the demonstrator sites, consulting on the service specification and developing the evaluation framework.

Phase 1 – delivering between 10,000 and 30,000 behavioural interventions across England in 2016/2017.

Phase 2 – continuation of phased roll out, achieving full coverage by 2019/20 (subject to final decisions about the pace of implementation).

The seven demonstrator sites for the programme – based in *Bradford, Birmingham, County Durham, Herefordshire, Medway, Salford and Southwark* – are all taking different approaches to implementing a DPP in their area, either expanding existing successful prevention programmes, adapting other programmes or preparing to work with future national providers.

They are also taking innovative approaches to engaging people in their programmes, through working in partnership with other organisations or engaging volunteers to help raise awareness and uptake of the service. Local health economies will be encouraged to think about local requirements and approaches to engagement, as we know that one size does not fit all for such a diverse target audience.

Stakeholder involvement

The NHS DPP User Involvement Group was established in June last year, bringing together people at high risk of Type 2 diabetes to ensure that the needs and experiences of people at risk are at the heart of the programme design and implementation. Facilitated by Diabetes UK, the group provides regular feedback to the programme management team with their views on referral options, programme content and messaging.

A consultation on the draft service specification over the summer generated feedback from the public, providers, clinicians and commissioners – as well as a range of stakeholders – and these responses are currently being reviewed. Other opportunities for stakeholders to inform the programme will be made available as the programme develops. To stay involved please visit ***www.england.nhs/ndpp*** or email ***diabetesprevention@phe.gov.uk*** to sign up to the mailing list.

Monitoring outcomes

The NHS DPP has the potential to be a truly game-changing programme, reducing pressure on the system, helping people regain better health, and delay or stop a diagnosis of Type 2 diabetes. The evaluation framework will assess key indicators of diabetes risk (weight loss and reduction of HbA1c levels) at enrolment, six and 12 months and at the end of the intervention (if this is different to 12 month landmark) to determine the extent to which participants have reduced their risk. We are developing the framework to ensure we can measure the impact – on individual health, population health and on the wider system – and we look forward to working with providers, commissioners, clinicians and participants to ensure the programme reaches its full potential.

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Proud to have been selected as the single software provider for the Scottish Diabetic Retinopathy Screening Programme, serving 300,000+ patients across 14 health boards.

- *Common Pathway Compliant*
- *Can be integrated with Vector Diabetes Management & Vector Medical Retina (or linked to Medisoft)*
- *Comprehensive failsafe techniques*
- *Patient Workflows making system intuitive to use*
- *Team experienced in importing legacy data and images from other systems*
- *Full national reporting capability*
- *Powerful Query Engine for ad-hoc reporting reauirements*

Vector Diabetic Eye Screening is part of the Vector Long Term Care / Chronic Disease Management EPR platform.

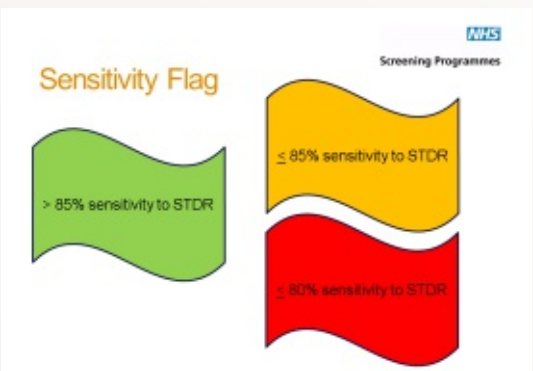
Other disease areas include Diabetes Management, Medical Retina, AMD, Endocrinology, Lipids, Sickle Cell, Hypertension, Rheumatology, Podiatry and Cardiac Rehab.

For more information, please contact Steve Courtney
steve.courtney@hisvector.com
07768 964689

New developments to test and training (TAT)

Recovery test sets for red flagged graders

We have improved the test and training system. New additional test sets are available for graders who are red flagged in the test and training (TAT) grading management reports. The reports calculate the sensitivity and specificity to sight threatening diabetic retinopathy (STDR) for every grader who participates in the tests. Sensitivity less than or equal to 80% will attract a red flag.



Graders with a red flag are not detecting enough sight threatening diabetic retinopathy in the test. This might mean they are also missing serious disease in live grading. Graders with a red flag should be withdrawn from unsupervised grading and started on a recovery action plan.

The grading management reports are renewed every quarter. This means any change in grading performance between quarters will not be seen in the normal reporting structure and there is a lag in the TAT reporting to reflect red flagged graders who may be improving in performance due to retraining and grading support. The recovery test sets have been developed to help graders who are taking the recovery test sets to demonstrate their standard of grading within a reasonable timescale. This is important to programme service delivery, and the recovery test sets provide a significant level of support for programmes in these circumstances.

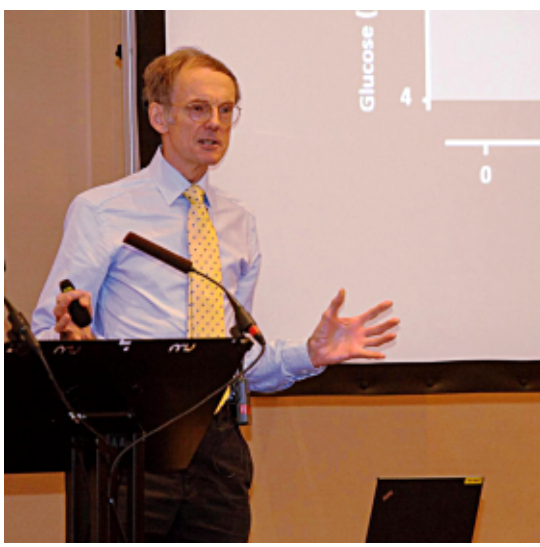
It is important to note that these recovery test sets are not training materials and are purely a measure of current performance in the test. The tests must only be taken in combination with targeted training and grading lead support. They should be included as part of a recovery action plan, in which retraining and grading support are the main focus. Retraining and grading support should continue until the grading lead is satisfied that the grader is grading to national standard in normal grading practice.

Graders who are taking the recovery test sets will have an additional report for sensitivity and specificity to STDR to allow real time tracking of their performance.
Guidance on the use of recovery test sets will be published on **GOV.UK.** **https://www.gov.uk/topic/population-screening-programmes/diabetic-eye**

The British Association of Retinal Screening 2015 Conference

The 15th annual BARS Conference was held in Bristol on 24th and 25th September 2015, and was attended by more than two hundred delegates representing a wide range of roles from within the field of diabetic eye screening. They were treated to a diverse programme of high quality presentations from speakers across the UK, covering relevant topics in ophthalmology, diabetes and screening.

The National Diabetic Eye Screening Programme (NDESP) was well represented by Lynne Lacey, the National Programme Manager, who gave an update on the current situation, and Patrick Rankin, the National Training and Education Manager, who gave a detailed explanation of the 'Clinical Healthcare Support Diploma in Healthcare Screening (Diabetic Eye Screening)' which will replace the City & Guilds Diploma in Diabetic Retinopathy Screening in April 2016 as the new mandatory qualification for those starting a career in diabetic eye screening. This look to the future was perfectly complimented by David Taylor, the recently retired National QA Manager, who looked back at the history of NDESP and his experiences in the early days of screening.

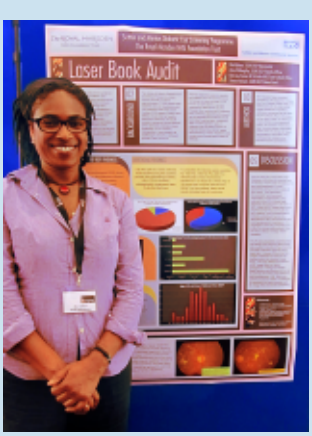


Among the ophthalmology topics featured at this year's conference were a Glaucoma Update by Bola Odufuwa, Consultant Ophthalmologist at the Royal Free Hospital in London, and a presentation on Diabetic Macular Oedema by Rehna Khan, Ophthalmology Lead at the Calderdale & South Kirklees DESP.

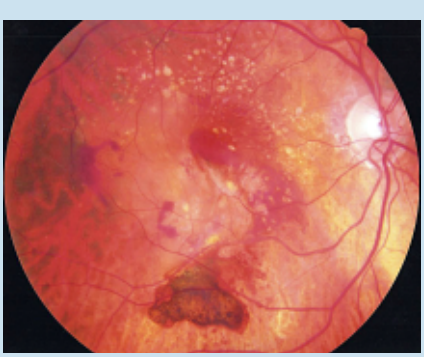
Dr Tunde Peto from Moorfields Eye Hospital gave a talk on Scanning Laser Ophthalmology, complete with some amazing ultra widefield retinal images, while Pearse Keane returned to the BARS Conference to give another update on the latest ground breaking developments in the field of Optical Coherence Tomography (OCT).

A number of fascinating case studies were presented by those working on the frontline of diabetic eye screening, sharing their experiences with unusual or challenging cases. These included undiagnosed retinal detachments; treatment for proliferative diabetic retinopathy; a pregnant patient with severe DR; and the case of a pancreatic transplant patient who went on to develop sight threatening retinopathy.

In addition to case studies, the good work of diabetic eye screening programmes was highlighted in a number of talks. Louise Clark from NHS Tayside described a project to encourage patients aged 12 to 30 to attend for screening, while Mark Histed & Jordan Laird from Medical Imaging detailed their attempts to increase attendance using a variety of methods.



A number of excellent posters were presented at the 2015 conference, with the first prize of £100 going to **Ros Ajiboye** from the Sutton & Merton DESP for her poster 'Laser Book Audit'. The two winners of the 2015 BARS/HISL Photography Competition were also announced. **Richard Bell** from the North of Tyne & Gateshead DESP won the Clinical category and **Stacey Barbaccia** from the Birmingham, Solihull & the Black Country DESP won the Artistic category. Richard and Stacey were each presented with an Apple iPad Mini 16GB by Steve Courtney, CEO of Health Information Systems (UK) Ltd who kindly sponsored the competition.



From the BARS Chairman, Grant Duncan

Alyson Jaycock from the Oxfordshire DESP looked at the issue of 'Diabetes Resolved' and Richard Hanson gave an entertaining review of the frustrations he has encountered over six years as ophthalmology lead for the North Yorkshire DESP. Paul Galsworthy from the Birmingham DESP spoke about his experiences of screening in Ethiopia as part of the LEOPARD Project, and Luke Rollin looked at diabetic eye screening from a Public Health England perspective.

The keynote lecture was delivered by Professor Roy Taylor from Newcastle University who spoke about his ground breaking work on weight loss to restore beta cell function in patients with type 2 diabetes. **Professor Taylor**, who was one of the founders of BARS, gave an inspiring and entertaining talk on his amazing research which offers the potential of a cure for type 2 diabetes through substantial weight loss over a short period of time.

The introduction of free membership in 2015 saw the ranks of the British Association of Retinal Screening quadruple over a few short months and at the time of writing this the Association has just shy of 600 members. However, with more than 2,000 people involved in delivering diabetic eye screening services we still have some way to go before we can truly claim to represent the UK screening workforce, so please encourage your colleagues to join.

In order to improve the Association we need to know what additional benefits BARS can bring to its members so are appealing to you all for ideas and suggestions for a more engaged and relevant British Association of Retinal Screening.

Our backing of the Diabetic Eye Journal is an example of how BARS can support the profession and help ensure our members are well informed and up to date. Each year our conference is packed with great speakers and excellent educational content and registration for the 16th annual conference, to be held in Birmingham in September, will soon be open.

BARS recently hosted a third successful Failsafe workshop day in Yorkshire and we are keen to offer more of this type of event to all our members, regardless of their job role.

Whilst it's fair to say that diabetic eye screening in the UK is in a constant state of transformation, we are currently in the midst of some particularly significant changes. With smaller programmes merging to form larger regional ones, a planned extension of the screening interval for some screen negative patients, a consultation looking at the possibility of a single national IT solution and advances in technology, including automation, OCT Angiography and wide-field imaging, we as an association need to be sure that the views of our members and the needs of our patients are properly addressed. BARS has active representation on several national groups including the DES Advisory Group and the Grading Resources Advisory Group but we can only truly represent your views if you share them with us. So please, get in touch by email on ***barschair@gmail.com***.

I look forward to seeing you in Birmingham in September.

This year's BARS Conference will be held on 22nd and 23rd September 2016 in Birmingham. If you would like to present a paper, poster or case study, or enter this year's photography competition, visit the BARS website at *www.eyescreening.org.uk* to download an application form.

"Working to Support Professionals Involved in Retinal Screening for People with Diabetes"

british association of retinal screening bars

The Growing Family of Health Intelligence DESPs

Health Intelligence (HI) is a private provider of diabetic eye screening services and software for the NHS. Our team has extensive experience, having implemented almost a dozen DESPs over the past 10 years. Our headquarters are based in Sandbach, Cheshire and we have offices in Bury St Edmunds, Suffolk; Perivale, Middlesex and Waterlooville, Hampshire.

We believe our success has been down to delivering a safe, high quality programme incorporating innovation and a patient focus:

1. GP Practice Clinical System Data Exports (GP2DRS equivalent)

A critical stage in any screening programme is the establishment and maintenance of an accurate register of all patients aged 12 and older with a diagnosis of diabetes. We can only achieve this with the support of all GP Practices. Our monthly data exports identify patients who are eligible for the screening programme and placed on a referral list for GP Practice users to efficiently refer. Once referred, all subsequent updates, for example, changes of address are automatically updated through the exports.

The exports also identify patients who have data indicating diabetes but with no formal diagnosis. These are highlighted to the GP Practice to undertake clinical reviews and diagnose if appropriate. In East Anglia, this process identified over 4,600 patients with diabetes, whose sight and health would have been at risk otherwise. As a GPSoC Lot 3 framework supplier we have access to solutions for the export and pushback of Read coded data into GP Practice clinical systems. A development project has begun to deliver facilities which will push back the screening results into each patient's electronic record. We envisage this solution will save each Practice 2-3 weeks per annum in administration time.

2. Patient and Healthcare Professional Website

In this digital age, we understand that a lot of patients now wish to feel more empowered and take the time to seek out information. So a patient website, alongside the traditional and vital bookings office telephone, is a must for all our programmes! It provides information on diabetic retinopathy, the appointment and what results mean, but most importantly on current screening venue locations (including a map) and how to contact the programme (for example ***www.nwldesp.co.uk***).

The websites also include a 'Login' section that any healthcare professionals in the area can access to keep up to date on any programme developments.

Our Current Programmes

Health Intelligence currently runs three DESPs:

East Anglia
North West London
Portsmouth & South East Hampshire.

East Anglia

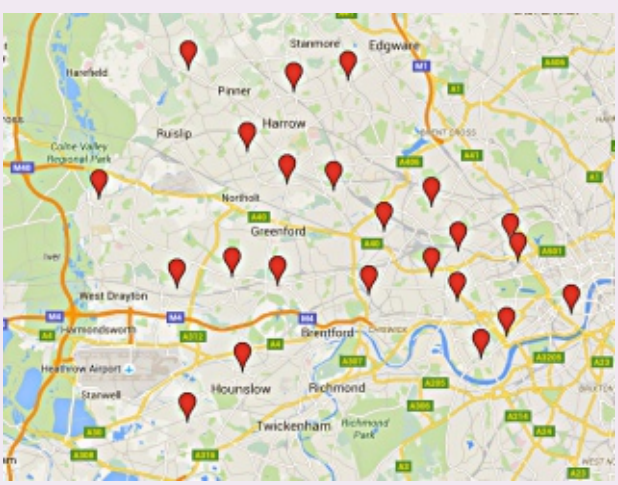
East Anglia DESP was formed by merging North East Essex DESP; Great Yarmouth & Waveney DESP; and Suffolk & West Norfolk DESP. The merging of three smaller programmes brought its challenges; firstly as they were run by different providers, two by hospitals and one by a community provider; and secondly they were operating different delivery models, one by Community Optometrists; another used fixed sites with single retinal screeners and the third used two man teams of Retinal Screeners.

Our proactive management and excellent team have ensured East Anglia has gone from strength to strength. We have successfully increased uptake rates; 82% in year one (2012/13), 87% in year two (2013/14) and 90% in year three (2014/15). This has been achieved while the diabetic population has increased from 84,500 to 109,000 patients. We put our success down to focusing on the patient and the entire screening pathway. In particular, through co-ordinating our service with General Practice via our automated monthly data export service; coupled with our excellent DESP software, Spectra, assuring each element of the pathway.

We are delighted that we will be able to continue our work after winning the recent tender to run the expanded East Anglia DESP (incorporating Peterborough & Cambridgeshire DESP) with a population of over 125,000 patients from 1st April 2016. We were also successful in winning the Essex DESP tender, which will bring together the two current programmes, South East Essex DESP and South West & West Essex DESP, with the parts of Essex currently in our East Anglia DESP. This programme when it commences on 1st April 2016 will have a population of over 118,000.

North West London

In November 2015, we started providing North West Londoners with diabetic eye screening services. We were one of five organisations chosen to introduce a standardised screening model across London to improve the effectiveness and efficiency for patients. The North West London DESP (NWL DESP) is the largest programme in London with a population of 130,000 patients from six previous programmes; Brent DESP, Ealing, Hounslow & Kingston DESP (Kingston is now part of South West London DESP), Hammersmith & Fulham DESP, Harrow DESP, Hillingdon DESP and Kensington, Chelsea & Westminster DESP.



It is early days in the life of NWL DESP but we already have 387 out of 394 (98%) GP Practices signed up to the monthly data export arrangements and are currently providing them with training on our easy to use web-based software, HI Hub (Spectra). A single mouse click sends a referral to the Programme, saving the Practice time and ensuring no-one is missed.

healthintelligence™

Portsmouth & South East Hampshire

We started the New Year in the best way by mobilising a new programme! On 5th January 2016 we took over the Portsmouth & South East Hampshire DESP (PSEH DESP). We have welcomed another lovely team of colleagues into our Health Intelligence family who will be serving a population of over 32,000 patients.

Our Vision

Our MD, **Phil Kirby**, founded Health Intelligence in 1996 and maintains a vital role in the company shaping strategy and innovation. After graduating from Keele with an MBA on the Health Executive Programme, Phil spent thirteen years in the NHS as a senior manager responsible for I.T., registration and screening functions. This experience from within the NHS and private sector has given him an in-depth understanding of how cross sector population-based solutions can help the NHS overcome key challenges. Phil was involved in some of the first screening programmes and national level initiatives, including the National Strategic Tracing Service which gave him an insight in to how we might transform the NHS through better information analytics.

Our company mission is to design and develop innovative software solutions that enables and transforms the way healthcare is delivered. Along with ISO9001, we are also ISO27001: 2013 certified by ISOQAR, a UKAS accredited company. ISO27001 is the best-known standard for an information security management system (ISMS). This covers both our analytics and diabetic eye screening services.

Certificate Number 11454
ISO 27001

Spectra

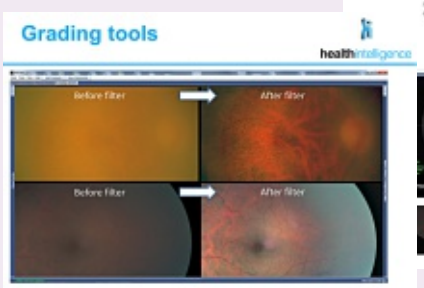
We have been running DESP services for many years, so have first-hand experience of the support Programmes require from the software. Therefore, over the past 10 years, we have designed and developed Spectra, an innovative screening and surveillance software that provides efficient and high quality support for DESPs.

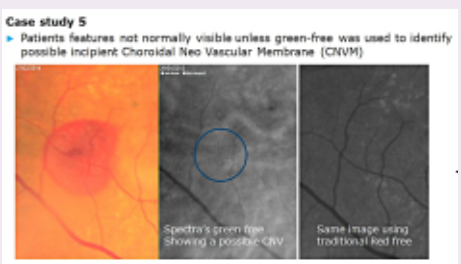
We are delighted that Spectra is the first software to be fully certified by the national team at level 3, the final stage of the Common Assurance Process (CAP). Importantly Spectra is proven in the field and has been developed with all users in mind.

Spectra supports both online and offline modes of operation, with a browser based programme management module enabling all stakeholders to access the solution. Grading at all levels is supported through advanced filters, image manipulation and annotation, and to ensure the links between primary and secondary care are effective there is a Hospital Feedback module.

Our Head of Clinical Development, Greg Russell, is continually researching and testing innovative features that meet the needs of an efficient, high quality DESP such as:

- Automated Internal Quality Assurance flagging and reporting
- Image clarity filters - Research is ongoing in to types of filters to enhance retinal images, improve image accessibility, allowing for early detection of sight threatening pathology
- Image manipulation - annotation and macular identification during grading

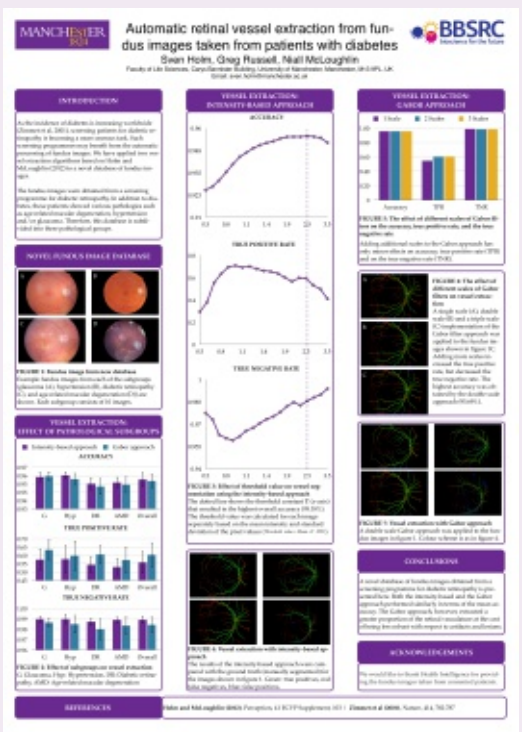




"Spectra feels like a breath of fresh air. It is quick, user-friendly, feature-filled and safe. The customisable referral and outcome features are a real bonus to allow it to adapt to variations in regional or national service requirements" Craig Goldsmith (MA MB Bchir FRCOphth) – East Anglia DESP Clinical Lead.

MDT Meetings:

All staff in our three programmes have to attend a bi-monthly MDT meeting. MDT meeting days are non-screening days for all clinics including Community Optometrists in order to support and encourage attendance. These meetings are for CPD, training, feedback on performance and to participate in open discussions on service developments. The agenda also includes extra presentations for example, a Clinical Lead presentation, interesting grading cases or a guest speaker e.g. a Paediatric Diabetologist, expert patient. Recent extra presentations included a camera workshop, an interesting talk on OCT and a first aid refresher session.


Automatic retinal vessel extraction from fundus images taken from patients with diabetes

Swan Holm, Greg Russell, Niall McLoughlin

BBSRC

Research:

Our Head of Clinical Development, Greg Russell, is very highly involved in conducting research into diabetic retinopathy and other conditions such as Glaucoma and AMD. Greg won the Best Paper Presentation for 'Countdown to Dilation' at BARS 2013. He is also actively involved with journal publications. There were 3 peer reviewed papers published as part of his MPhil; 'Enhancement of Colour Retinal Images in Poor Imaging Conditions', 'Automatic Retinal Vessel Extraction from Fundus Images taken from Patients with Diabetes' and 'A Novel Fundus Image Database for the Automatic Extraction of Retinal Surface Vessels'.

More recently he has published and contributed to some interesting papers:

1. Validation of a model to estimate risk of progression of diabetic retinopathy using screening and clinical data in 3 cohorts. European Association for the Study of Diabetes meeting, Vienna, September 2014.

2. Individualised risk assessment for diabetic retinopathy and optimisation of screening intervals: a scientific approach to reducing healthcare costs - British Journal of Ophthalmology 2015.

3. Anatomical digital image analysis of the angle and optic nerve – a novel method for glaucoma imaging EVER 2015 congress, Nice, France. Free paper session - Molecular and morphological studies in ocular diseases.

4. Validation of a risk stratification algorithm for progression to referable diabetic retinopathy EASDec, Turin 26-28 June 2015.

Greg is also actively involved as a principle investigator for the Marie Curie ITN Retinal Vascular Modeling, Measurement And Diagnosis (REVAMMAD) European Union project aimed at combatting some of the EU's most prevalent chronic medical conditions using retinal imaging. The project aims to train a new generation of interdisciplinary scientists for the academic, clinical and industrial sectors, to help trigger a new wave of biomedical interventions. PhD students will be trained by some of the EU's leading academics and practitioners to achieve further advances in diagnosis, prognosis and prevention of diseases such as diabetes, hypertension, stroke and coronary heart disease and retinal diseases.

As part of this important project, we are hosting, Evi Kotsiliti, a funded PhD student known as an Early Stage Researcher (ESR). Evi is a PhD student from the University of Lincoln, currently investigating the 'Cost effectiveness analysis of approaches towards screening for diabetic retinopathy'. At the 2014 Ophthalmic Imaging Association event, Evi gave a talk on the project and her progress to date.

NHS Diabetic Eye Screening Programme update

UK NSC recommends extending screening intervals to 2 years for low risk patients

The UK National Screening Committee (UK NSC) has recommended that low risk patients only need to attend diabetic eye screening tests every 2 years rather than annually.

The committee proposed the change based on the evidence of the Four Nations Diabetic Retinopathy Screening Study Group. This study was published in Diabetes Care by *Lees et al* in November 2014. The group studied screening results from more than 350,000 patients from Wales, Scotland, Northern Ireland and four English programmes (Brighton, Derbyshire, Leeds and Staffordshire).

The group's analysis proved it is clinically and cost effective to screen the lowest risk patients every 2 years rather than every 12 months. Introducing this change should reduce the total demand for diabetic eye screening by 35% – or more than 650,000 appointments a year. This will free up capacity to support patients at higher risk without making screening any less effective for those at low risk. The NHS Diabetic Eye Screening Programme has set up an expert group to think through the details of implementing this variable screening intervals recommendation should it be agreed by the Department of Health and ministers.

The UK NSC's recommendation can be found at **http://legacy.screening.nhs.uk/diabeticretinopathy.**

New reports will help improve grading consistency and quality

To ensure consistent high quality grading of digital photographs, all graders should complete monthly test and training sets in line with the national grading criteria **(https://www.gov.uk/government/publications/diabetic-eye-screening-retinal-image-grading-criteria).**

The national programme team has produced new reports to help screening providers and graders monitor performance in these test sets at individual and programme level. The reports flag up issues according to graders' participation in the tests and their ability to identify referable disease correctly. This is the first time the DES programme has had a standardised grading performance monitoring tool. Regular use of the reports will mean programmes can react quickly to grading performance issues and take action to raise standards. They will also inform commissioners better about grading performance and help QA teams support programmes that are struggling.

Shelley Widdowson, national grading lead, and Patrick Rankin, national education and training manager, have produced an overview of the reports **(https://phescreening.blog.gov.uk/wp-content/uploads/sites/152/2015/12/Grading-quality-reports-final-v1.0.pdf).** This includes how to access them, what they look like and what the different flags and reports mean. The reports are available to commissioning and screening quality assurance teams as well as providers.

For more information on the new reports, see the national guidance document **(https://www.gov.uk/government/publications/diabetic-eye-screening-assuring-the-quality-of-grading).**

Local DES providers give feedback on national IT system proposal

The national programme is exploring the potential for developing a single national IT system to support diabetic eye screening. This follows the outcome of two reviews that concluded that local IT provision was not appropriate for the longer term operation of a national screening programme. Approval was given for a *'discovery phase'* to find out what users of DES IT systems would need a single national system to provide. During this phase, the team has been looking at what currently works well and what users would like improved. It has sought the views of a wide range of local programme staff, including managers, screeners, graders, administrators and failsafe officers, as well as commissioners, QA teams, GPs and service users. This will help the team understand what a national system would need to look like in order to be effective. A decision will then be made whether to proceed with the proposal.

Update on national diabetic cohort data extraction service (GP2DRS)

The GP2DRS national cohort data extraction service is currently being piloted in three screening programmes (South West London, Kent and Gloucestershire) and more than 400 GP practices. Once implemented, this new national system will automate the supply of cohort data from 8,000 GP practices in England to local DES programmes.

During the pilot phase, the national programme is testing the data quality, functionality and support of the system. After the successful completion of the pilots, GP2DRS will allow local programmes to log into a secure system to view changes to their cohorts on a monthly basis. Reports will help them see any new patients they should invite for screening and any patients they no longer need to screen.

In the meantime, programmes and GPs should continue with any local data extraction processes they have in place. The national team will notify programmes when the GP2DRS service can be switched on. A number of supporting documents and processes will be published in due course to inform programmes how to move on to the service.

Partial national data reported for 2014-15

For the first time in several years, the NHS Diabetic Eye Screening Programme was able to publish national level figures for the 2014-15 screening year.

The data below is from the 68 (81.9%) local programmes in England that reported on comparable DES common pathway data during the year. Of the remaining 15 local programmes, 13 migrated to the common pathway during 2014-15 and two migrated in 2015-16.

NHS Diabetic Eye Screening Programme headline data 2014-15	
Eligible people with diabetes known to programme	2,305,176
Offered screening (routine digital screening)	2,004,242
Tested (routine digital screening)	1,664,890
Uptake	83.1%
New registrations to progammes	205,688
Urgent referrals (R3A)	6,255
Routine referrals (R2M1, R2M0, R1M1)	43,407

Source: programme performance reports and programme screening to treatment timeline trackers.

The national programme plans to publish individual programme level data for 2015-16 and also hopes to collect uptake data by CCG and local authority that can be incorporated into national tools such as the Public Health Outcomes Framework and Healthier Lives, raising the profile of diabetic eye screening.

National programme standards reviewed

The NHS Diabetic Eye Screening Programme is in the process of reviewing the national programme standards. Structural and outcome standards have been removed and new standards capturing the key points of the digital surveillance and slit lamp biomicroscopy standards have been added.

The draft proposed standards have been reviewed by the PHE screening data analysis and quality assurance group to ensure consistency with other national screening programmes. They are currently out for their second consultation and local programmes, the screening quality assurance service, RNIB and Diabetes UK have all been asked to comment.

The new standards will be published in April 2016. There will then be a year to implement them into the screening software before they go live in April 2017.

Intraocular Tumours in Adults

[1, 2]Mr Mandeep S. Sagoo, [1]Mr Ido Didi Fabian,

[1] Ocular Oncology Service Moorfields Eye Hospital, [1, 2] UCL Institute of Ophthalmology, London, UK

Introduction

Ocular oncology is a subspecialty of ophthalmology that encompasses the clinical management of patients with eye tumours. Eye tumours can appear at any of the ocular tissues, including the orbit, ocular adnexa, ocular surface and within the eye. In this review we will focus on intraocular tumours in adults, which require high expertise to accurately diagnose and best manage this subset of patients.

Intraocular tumours may be classified according to a wide range of variables, including their malignant potential, incidence, age of presentation, anatomical location within the eye, tissue from which the tumour stems from, relation to systemic disease, and primary site of origin (i.e. a primary ocular tumour vs. secondary deposit from a distant cancer).

Patients with intraocular tumours may present with acute vision-related symptoms, such as reduced visual acuity, visual field defects, flashing lights or floaters, however could experience no symptoms at all, depending on the size and location of the tumour. A significant number of asymptomatic patients harbouring an intraocular tumour are primarily diagnosed on routine eye examinations done by optometrists or as part of screening surveys for other diseases such as diabetic retinopathy. As some of the tumours are not only sight and eye threatening, but also life threatening, basic knowledge and awareness are of utmost importance when performing a general eye test.

The main benign and malignant intraocular tumours in adults that will be discussed in this review are choroidal naevus, choroidal melanoma, choroidal osteoma, choroidal haemangioma, retinal capillary haemangioma, vasoproliferative tumour, sclerochoroidal calcification and intraocular lymphoma.

Choroidal Naevus

The commonest fundus tumour is a benign choroidal naevus (**Figure 1**), arising from melanocytes of the choroidal stroma, often discovered as an incidental finding and is rarely symptomatic. It is a flat or minimally elevated pigmented lesion, but infrequently can be a pale colour. Overlying changes such as drusen or retinal pigment epithelial changes imply chronicity.

Approximately 5% of the white population has a choroidal naevus and the risk of malignant transformation is low (approximately 1:8,000).[1] A choroidal naevus does not usually warrant treatment, however leakage of fluid into the subretinal space, presence of visual symptoms, secretion of orange-pigmented lipofuscin and/or growth, raise the suspicion for malignant transformation into choroidal malignant melanoma and need for intervention. Occasionally a naevus will cause symptoms without malignant transformation, such as the onset of choroidal neovascularization.[2]

Patients diagnosed from photographic diabetic retinopathy screening with a choroidal naevus should be referred to an ophthalmologist, retinal specialist or even an ocular oncologist depending on the level of suspicion for a complete evaluation. In future this may be changed into a virtual assessment process,[3] but for now, the gold standard remains clinical examination, photographic and ultrasonographic documentation. If such lesions are discovered in optometry practices, often this is due the increasing use of fundus camera technology. For very bland, flat, chronic non-suspicious lesions, there is the possibility of optometrist monitoring for growth or development of more suspicious features.

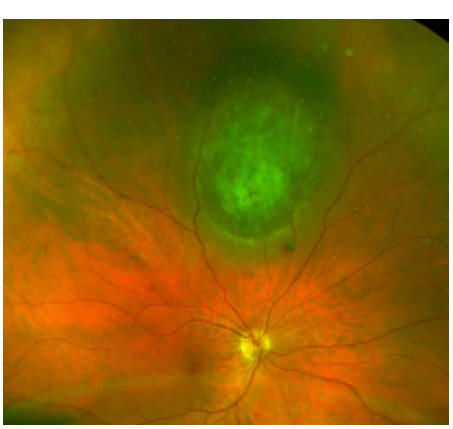


Figure 1: A right eye choroidal naevus with overlying drusen.

Choroidal Melanoma

The most common primary intraocular malignancy in adults is choroidal melanoma (**Figure 2**), with estimated incidence of 6 cases per million population.[4] A non-diagnosed or non-treated choroidal melanoma will eventually not only threaten vision, but also the integrity of the globe and even risk life. Early detection of a choroidal melanoma is of paramount importance, as tumour size directly correlates with chances of metastatic spread. Patients with large tumours (>10 mm in thickness) have an estimated chance of 50% to developing distant metastasis in 10 years, with the liver being the main target organ.[5]

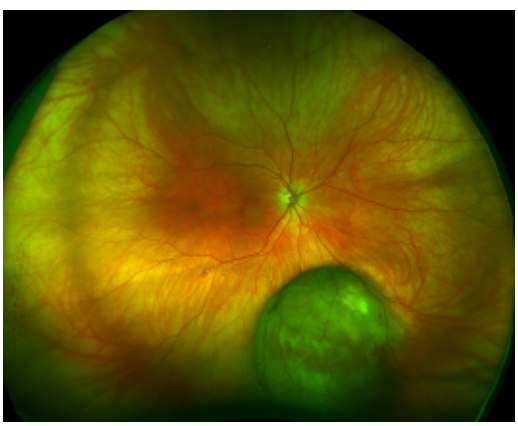


Figure 2: A right eye choroidal melanoma.

Common symptoms related to choroidal melanoma include blurred vision, floaters and photopsia. However, patients can be asymptomatic, and the lesion picked up on a routine eye check. Compared to choroidal naevi, a choroidal melanoma is an active cancer that grows in size (albeit slowly) and leaks subretinal fluid, and therefore more commonly causes visual symptoms.

Examination reveals a dome-shaped or 'collar stud' mass, located in the choroid, usually pigmented, but can occasionally be partly or entirely non-pigmented (amelanotic). Retinal detachment and lipofuscin orange pigment deposition are common features. Less frequently, they can cause severe glaucoma, cataract, and even extra-ocular extension into the orbit. Such tumours generally carry a worse prognosis.

The main treatment option nowadays for choroidal melanoma is localized radiotherapy, by means of plaque brachytherapy or proton beam radiation. Removal of the eye (enucleation) is reserved for advanced cases or those that failed primary conservative treatments.

Deciding on which treatment modality should be employed depends on multiple factors, including tumour size, visual acuity of the affected eye and contralateral eye, age and general health of the patient, and the presence of metastases. Metastatic spread at the time of treatment is unusual, but systemic screening is advised for detection of liver involvement, even years after treatment of the primary intraocular tumour.

Ocular Metastasis

Secondary deposits from distant malignancies occur in the eye, particularly in the choroid due to its vascular nature.[6] The commonest primary cancers to metastasize to the eye are lung cancer in males and breast cancer in females. In approximately 2/3 of cases the primary site of the cancer is already known, but in the other 1/3 will prompt examination and imaging of the rest of the body. If no primary cancer is found, then biopsy of the eye tumour may be required. Choroidal metastases present as yellow creamy subretinal deposits that grow rapidly. (**Figure 3**) They tend to leak fluid in large amounts, as compared to primary ocular malignancies.

Treatment involves controlling the primary tumour site, but also local treatment to the eye with external beam radiotherapy (EBRT), visudyne photodynamic therapy (PDT) or plaque radiotherapy to try to preserve as much vision as possible. Patients with poor systemic status usually warrant observation only and systemically treatment-naïve patients that were newly diagnosed might benefit from systemic therapy (e.g. chemotherapy) to have a positive effect on the ocular deposits.

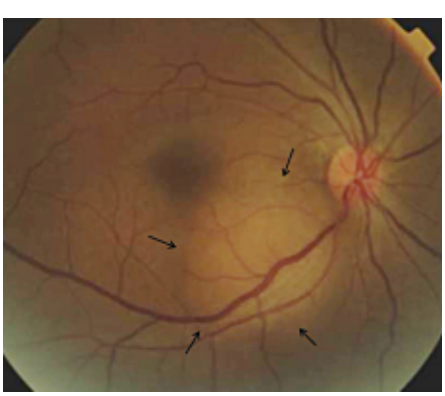


Figure 3: A right eye pale choroidal metastasis (arrows).

Choroidal Osteoma

Choroidal osteoma (**Figure 4**) is a benign intraocular tumour composed of mature bone that typically replaces the full thickness of the choroid, and hence is a choristoma (abnormal tissue growth not indigenous to that anatomical location).

The tumour classically manifests as an orange-yellow plaque deep to the retina in the juxtapapillary or macular region. It typically occurs as a unilateral condition found in healthy young females in the second or third decades of life. Patients with a choroidal osteoma may be asymptomatic. When symptoms are present they include mild to severe visual blurring, metamorphopsia, and visual field defects corresponding to the location of the tumour. Clinical complications of a choroidal osteoma include enlargement of its basal diameter, leakage of subretinal fluid and development of subretinal neovascularization with or without hemorrhage.[7] Management options include observation, when no complications occur, or the use of intravitreal anti-VEGF or laser for treatment of neovascular membrane and subretinal fluid.

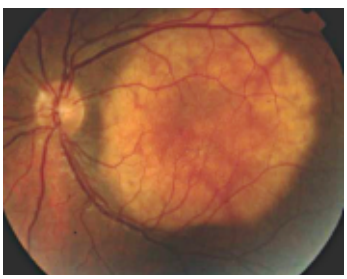
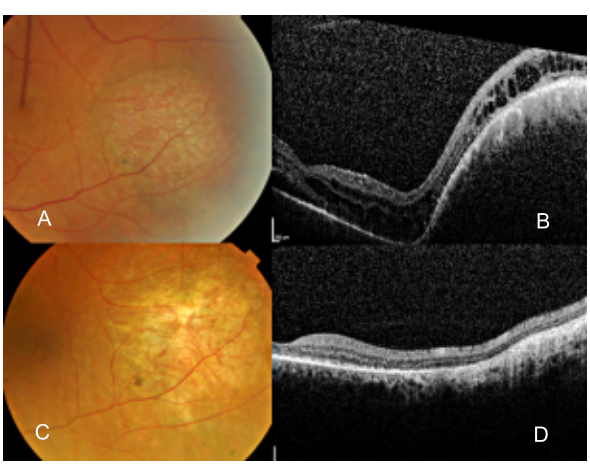


Figure 4: A left eye choroidal osteoma in the macular region.

Choroidal Haemangioma

Choroidal haemangiomas are benign, vascular hamartomas, classified as circumscribed or diffuse. The circumscribed form (**Figure 5**) occurs sporadically, while the diffuse one is related to Sturge-Weber syndrome, a rare non-hereditary neuro-oculo-cutaneous syndrome presenting at childhood.[8]



Circumscribed choroidal haemangiomas commonly occur between the second and fourth decades of life, are usually asymptomatic, but may be associated with visual symptoms, including decreased vision, metamorphopsia, floaters and photopsia. On clinical examination, circumscribed choroidal haemangiomas appear as orange colored masses with indistinct borders. Ultrasonography usually demonstrates a dome shaped choroidal lesion with high internal echogenicity. Leakage of fluid into the subretinal space overlying the choroidal lesion is a common manifestation, and depending on location, might result with visual loss. Management options for circumscribed choroidal haemangiomas include monitoring asymptomatic cases, use of oral beta blockers, laser photocoagulation, visudyne PDT, and for resistant or large tumours, EBRT. Resolution of SRF is achieved in most cases; however visual prognosis depends mainly on tumour location (i.e. involvement of macula).

Figure 5: A left eye choroidal haemangioma (A), with overlying sub- and intra-retinal fluid, as shown on OCT (B). After treatment with photodynamic therapy, the lesion formed into a scar (C) and fluid resolved (D).

Retinal Capillary Haemangioma

Retinal capillary haemangioma (RCH) is a benign retinal vascular tumour. (**Figure 6**) RCH may occur sporadically or in association with von Hippel Lindau (VHL) disease, a genetic disorder, which may involve the adrenal glands, kidneys, cardiovascular system, spine and central nervous system.[9]

The mean age of diagnosis of RCH in VHL patients is 25 years old. Common symptoms include vision deterioration and photopsia, however patients may be asymptomatic and diagnosed indecently in a routine eye examinations or as part of screening test for families with VHL. On clinical examination and more evident on fluorescein angiography, a prominent feeding vessel and a draining vein are commonly seen entering and exiting the tumour.

Most RCH are located in the temporal periphery and cause intra- and subretinal leakage. Treatment options include observation for small tumours, laser photocoagulation of the tumour and/or feeding artery, cryotherapy, visudyne PDT and plaque radiotherapy. In advanced cases, complicated with retinal detachment, vitreoretinal surgery is a valid option.

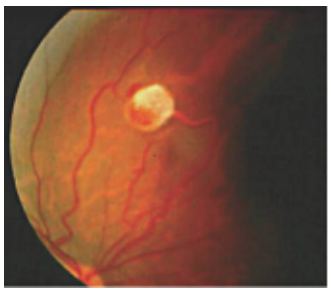


Figure 6: Retinal Capillary Haemangioma

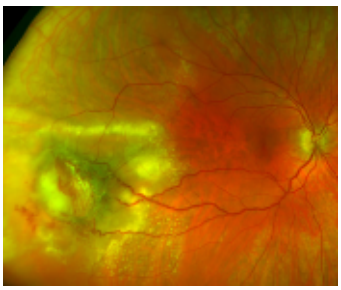


Figure 7: A right eye vasoproliferative tumour with surrounding exudation.

Vasoproliferative Tumour

Similarly to RCH, a vasoproliferative tumour (VPT) is a benign vascular retinal lesion, presenting in the 3rd – 4th decades of life. VPTs appear as isolated lesions (**Figure 7**), but may develop secondary to a pre-existing ocular disorder, in which case multiple lesions are commonly found.[10] VPTs are usually present in the peripheral retina and show significant leakage of fluid. They can be distinguished from RCHs by the absence of large dilated feeder and drainage vessels that commonly occur with RCHs. Macular pucker is a common feature, causing visual deterioration. Treatment options used for RCH are used also for VPT, and decisions as to the best management step depends on tumour size, location, related clinical complications (e.g. exudation, epiretinal membrane) and association to other ocular disorders.

Sclerochoroidal Calcification

Sclerochoroidal calcification is a rare benign condition that classically manifests as multiple discrete yellow lesions, often discovered as an incidental finding in asymptomatic older white individuals. (**Figure 8**) This condition may be idiopathic, secondary to hypercalcemia, or syndrome-associated.[11] The clinical appearance is typical and recognizable by indirect ophthalmoscopy as an elevated mass with overlying retinal pigment epithelial atrophy. Diagnostic evaluation using ultrasonography can confirm the presence of intrinsic calcification. The lesions are commonly bilateral and located in the superotemporal quadrant along the arcades, and are frequently multiple, features that help differentiating them from choroidal osteoma. Patients diagnosed with sclerochoroidal calcifications require no ocular intervention unless vision loss occurs from the development of a choroidal neovascular membrane. They should undergo systemic workup to screen for abnormalities in calcium and phosphate metabolism.

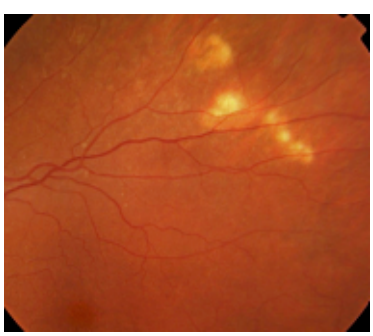


Figure 8: Typical appearance of a left eye sclerochoroidal calcifications located along the superotemporal arcade.

Primary Intraocular Lymphoma

Primary intraocular lymphoma, or PIOL (**Figure 9**), is an intraocular malignancy that is a subset of primary central system lymphoma (PCNSL). Approximately one-third of PIOL patients will have concurrent PCNSL at presentation, and up to 90% will develop PCNSL within 1-2 years.[12] PIOL is bilateral in up to 85% of cases, although initially it may seem unilateral. Posterior segment findings of PIOL include the presence of vitreous cells in the majority of cases. Another sign is the development of creamy lesions with orange-yellow infiltrates that are deep to the retina. Imaging studies, including fluorescein angiography, OCT and ultrasonography, and tissue (vitreous/retina/choroid) biopsy are usually required for diagnosis. Treatment of PIOL includes systemic chemotherapy and eyes and brain radiotherapy. Intravitreal chemotherapy with methotrexate is used to control the ocular disease. Mortality rate in PIOL patients may be as high as 80% in 3 years.

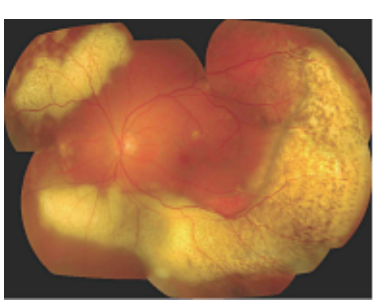


Figure 9: Primary intraocular lymphoma in the left eye showing diffuse subretinal creamy deposits.

Conclusion

Ocular oncology is an important branch of ophthalmology, as many of these patients have diseases that carry significant morbidity and mortality. Intraocular tumours are managed in ocular oncology referral centres by clinicians highly specialized in the field. These centres are well equipped with state-of-the-art imaging and a range of treatments may be required for a successful outcome. Early detection in the primary care setting and appropriate referral is of utmost importance and a major factor in the final prognosis of these patients.

Correspondence

Mandeep S. Sagoo,
Moorfields Eye Hospital, City Road, London, EC1V 2PD, UK
Tel: 020 7253 3411
Email: *Mandeep.sagoo@moorfields.nhs.uk*

Mr Mandeep Sagoo Consultant Ophthalmic Surgeon
Ocular Oncology, Retinoblastoma & Medical Retina
Moorfields Eye Hospital & Barts Health NHS Trust, London, UK
Senior Lecturer, UCL Institute of Ophthalmology

Mr Didi Fabian Fellow in Ocular Oncology and Retinoblastoma
Moorfields Eye Hospital & Barts Health NHS Trust, London, UK

References

1. Shields CL, Furuta M, Berman EL, et al. Choroidal nevus transformation into melanoma: analysis of 2514 consecutive cases. Arch Ophthalmol (Chicago, Ill 1960). 2009;127(8):981-987.

2. Papastefanou VP, Nogueira V, Hay G, et al. Choroidal naevi complicated by choroidal neovascular membrane and outer retinal tubulation. Br J Ophthalmol. 2013;97(8):1014-1019.

3. Balaskas K, Gray J, Blows P, et al. Management of choroidal naevomelanocytic lesions: feasibility and safety of a virtual clinic model. Br J Ophthalmol. September 2015.

4. Egan KM, Seddon JM, Glynn RJ, Gragoudas ES, Albert DM. Epidemiologic aspects of uveal melanoma. Surv Ophthalmol. 32(4):239-251.

5. Shields CL, Furuta M, Thangappan A, et al. Metastasis of uveal melanoma millimeter-by-millimeter in 8033 consecutive eyes. Arch Ophthalmol. 2009;127(8):989-998.

6. Arepalli S, Kaliki S, Shields CL. Choroidal metastases: origin, features, and therapy. Indian J Ophthalmol. 2015;63(2):122-127.

7. Aylward GW, Chang TS, Pautler SE, Gass JD. A long-term follow-up of choroidal osteoma. Arch Ophthalmol (Chicago, Ill 1960). 1998;116(10):1337-1341.

8. Tsipursky MS, Golchet PR, Jampol LM. Photodynamic therapy of choroidal hemangioma in sturge-weber syndrome, with a review of treatments for diffuse and circumscribed choroidal hemangiomas. Surv Ophthalmol. 56(1):68-85.

9. Haddad NMN, Cavallerano JD, Silva PS. Von hippel-lindau disease: a genetic and clinical review. Semin Ophthalmol. 28(5-6):377-386.

10. Shields CL, Shields JA, Barrett J, De Potter P. Vasoproliferative tumors of the ocular fundus. Classification and clinical manifestations in 103 patients. Arch Ophthalmol (Chicago, Ill 1960). 1995;113(5):615-623.

11. Shields CL, Hasanreisoglu M, Saktanasate J, Shields PW, Seibel I, Shields JA. Sclerochoroidal calcification: clinical features, outcomes, and relationship with hypercalcemia and parathyroid adenoma in 179 eyes. Retina. 2015;35(3):547-554.

12. Sagoo MS, Mehta H, Swampillai AJ, et al. Primary intraocular lymphoma. Surv Ophthalmol. 2014;59:503-516.

New retinopathy tool that could improve accuracy and timely hospital referrals

Nick Barclay, a senior retinal screener and grader for the Surrey and Swindon NHS Diabetic Retinopathy Screening Programme Surrey, which is run by Virgin Care, has invented a new tool which has improved the accuracy of referrals to local hospitals. Improved accuracy means more patients with conditions that could lead to sight-loss are being diagnosed in time and referred to hospital for treatment.

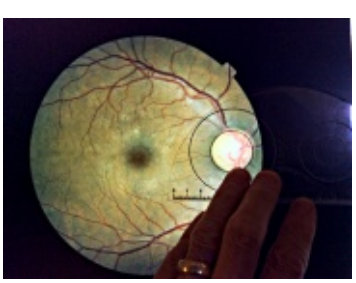
Retinopathy is an ocular manifestation of a systemic disease, in particular diabetes. It can affect up to 80 per cent of all patients who have been diagnosed with the life-long health condition for 10 years or more. Accurate measurements are critical to ensuring referral is made at the right time, particularly because the problems being detected can cause loss of sight.

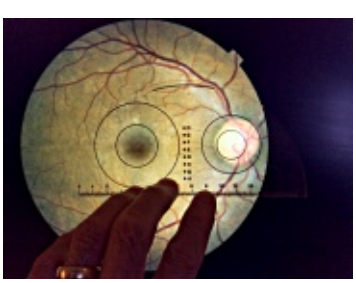
The 'Retinal Grading Tool' was developed as a part of a transformation training programme at Virgin Care. It was trialled over the course of several months and has received positive feedback from local screeners who are now using it as a matter of course to improve timely referral and reduce incorrect referrals.

The tool is a semi-circular piece of transparent plastic produced by a 3D printer with special markings to assess patients' retinopathy. It can be used with any monitor or software to review retinal images and has a variety of measurements enabling it to be used even when images are zoomed in. The markings allow graders to more accurately assess measurements of key features of the back of the eye. This is beneficial to patients as referrals can be made at the most appropriate time for and also cuts down on the number of secondary and tertiary checks by other graders helping them meet KPI requirements to manage demand effectively.

Nick said: *"The tool replaces old-fashioned and inaccurate methods that have traditionally been used in diabetic retinopathy screening programmes across the country. It can be overlaid onto your monitor and allows you to take accurate measurements and gives you, as a clinician, the confidence to know that you're providing the hospital with the right information."*

Following an evaluation of the grading tool's trial 75 per cent of Nick's colleagues said that they found the tool 'very useful' while 100 per cent of his colleagues said they were likely to use the tool daily. Graders also reported they were keen to continue working in the Surrey service since a clinician had been given the opportunity to instigate change and improve the system.





Nick is now demonstrating the tool at various exhibitions, most recently for World Sight Day at Moorfields Eye Hospital. The tool can be seen online at: ***www.virgincare.co.uk/gradingtool***. He is currently working with a 3D printing lab in London to cut down production costs and make a cost-price version available to other screening programmes across England.

Clinicians interested in purchasing a tool at cost price in the near future can also register their details on the website at ***www.virgincare.co.uk/gradingtool/***. For more information please contact **Nic Parkes, 020 7380 1792, Nic.Parkes@virgincare.co.uk.**

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Initiative to reduce diabetes-related sight loss extended following successful pilot

RNIB Supporting people with sight loss

A project to reduce preventable sight loss is to be introduced in Salford, Liverpool and Leeds following a successful pilot in Bradford.

The Living Well with Diabetes project, a joint working partnership between The Royal National Institute of Blind People (RNIB) and Action for Blind People, will benefit an extra 17,000 patients following a £400,000 Department of Health grant.

RNIB and Action for Blind People worked in partnership with health professionals and community leaders in Bradford as part of an initial pilot which saw a 15 percent increase in the uptake of eye clinic appointments amongst 400 members of the Pakistani community.

Due to the success of the trial a grant of £100,000 from Bradford Clinical Commissioning Group was then received which allowed RNIB to extend the project to people of all ethnicities living with diabetes in the city. This involved working with 30 GP practices.

People of South Asian ethnicity are up to six times more likely to develop diabetes compared to the general population and are therefore at risk of losing their sight due to diabetic retinopathy.

The success of the pilot and the award of the Department of Health funding means it will now be extended to reach patients in up to 90 GP surgeries in Salford, Liverpool and Leeds to benefit more people most at risk of developing a diabetes related eye disease.

As part of the initial pilot the trial reminders for appointments were sent by text and this was followed by a phone call from a bilingual member of staff. A traditional Sufi story *'Tether my Camel,'* drawing on the Islamic faith of the community, was used in the community groups to generate discussion and encourage people to take responsibility for their health. A self help management folder was also given to patients to be used as an organiser and help them share responsibility for the treatment of their diabetes.

Helen Lee, RNIB's Evidence and Service Impact Manager for Prevention, said: ***"Diabetic eye disease is still one of the leading causes of sight loss amongst working age people in the UK and people of South Asian ethnicity are more at risk than anyone else.***

"This project has demonstrated that by pooling resources and sharing expertise in working together we have been able to reach a significant group of people who might not otherwise engage in eye health services."

Evaluation of the initial pilot, which was carried out by the London School of Hygiene and Tropical Medicine, also showed that exposure to information about eye health and diabetes rose by nine percent as well as a 23 percent increase in understanding about the need to check blood sugar levels and attend appointments to reduce the risk of complications.

Greg Fell, Consultant in Public Health at Bradford & Airedale Teaching Primary Care Trust, said: ***"We've found a way of implementing self care that actually makes sense to those people who have the condition."***

The project has won a prestigious Quality in Care Diabetes 2015 award for the best initiative supporting self care of the disease.

About RNIB: Every 15 minutes, someone in the UK begins to lose their sight. We are the Royal National Institute of Blind People (RNIB) and we're here for everyone affected by sight loss - that's almost 2 million people in the UK. If you, or someone you know, has a sight problem, RNIB can help. Call the RNIB Helpline on **0303 123 9999** or visit ***www.rnib.org.uk***

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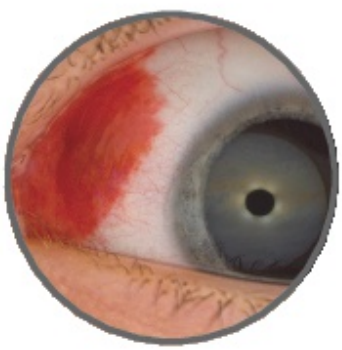

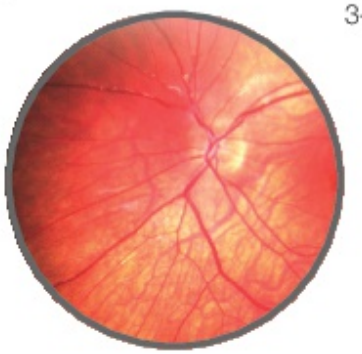

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A Day in the Life: RETINAL SCREENING

Lizzi Rogers from Royal South Hants Hospital

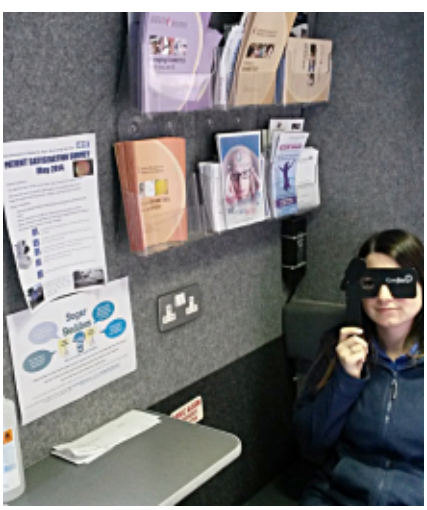
I've learned the hard way that describing my job isn't an easy task. I used to respond (when questioned) with "eye-screening", which invariably provoked a response along the lines of "yes please, I'll have a '99 with a flake".

My current 'go to' explanation is that I drive around Hampshire in a white van with tinted windows, stare deeply into people's eyes and flash them...which is technically true, and usually raises an eyebrow and a smile for long enough to then discuss retinal screening.

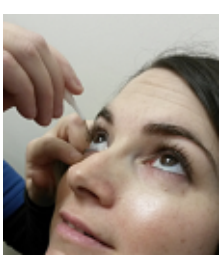
People who have been diagnosed with diabetes, who are over the age of 12 and have some vision in at least one eye, are entitled to receive annual retinal screening in an effort to safeguard their sight. Diabetic retinopathy occurs when chronically high blood glucose levels cause changes in the smallest blood vessels, including those in the retina, meaning that sometimes a patient's sight may be affected. The appointment serves not only as a chance to provide a safety check for their vision, but to offer some education about diabetes and the impact it can have (and truly, it's astonishing how many patients haven't understood why we screen, even though they might have been coming to us for years).

Mobile clinics are run at over 100 locations across Hampshire and the Isle of Wight, and we, the screeners are responsible for taking high-quality digital images, allowing the graders to establish whether or not each patient is suffering from diabetic retinopathy, and what the most appropriate onward care pathway is.

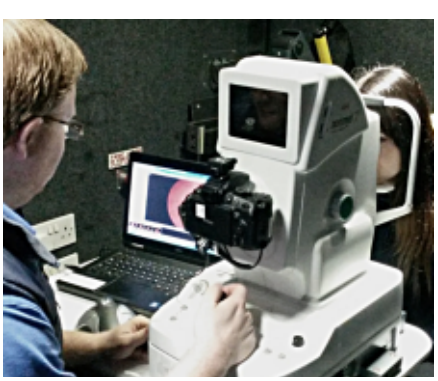
Our screening programme covers a population of over 42,000 patients, which is rising each year.



If you've never heard of our service, be glad, though I've a feeling our star (such as it is) is ascending, with an expectation that the prevalence of diabetes will rise to 4 million by 2025. Currently, 10% of the NHS budget is spent on diabetes and its complications (the complications being by far the higher cost) and the figures will only rise with an increase in numbers of diagnoses. However, the leading cause of blindness amongst working-age adults in the UK is no longer diabetic retinopathy and that's due to screening.



It seems, sometimes, like a rather unglamorous job: I pull up next to a doctor's surgery for the day, try to ingratiate myself with the receptionist, and see approximately 30 patients, establishing their visual acuity, administering dilating eye drops, and obtaining retinal photographs. I'm constantly on the go, moving patients between different areas of the van, and the surgery, and jumping in and out of whatever the weather has decided to throw down.



My patients are (with very few exceptions) friendly, personable sorts, who acknowledge the value of their appointment and submit to the drops and bright lights without complaint.

I might see a few cheeky old men (or women (for real!)), a generous handful of hard workers, and the occasional wide-eyed young teen. I tend to get called "sweetheart" or "darling", which is always better than the alternative, and I value the chance I have to allay people's fears and reassure them that with suitable blood-glucose control, and our support, there is no need for them to go blind.

At the end of the day, I return to our hub at the Royal South Hants and upload the images whilst reconnecting with the wider team; getting input on any patients who might have triggered immediate concern and discussing how the day went for each of us.

Then I get to leave the work-day behind me, continuing life beyond the vans, secure in the knowledge that I'm a tiny, but very important cog in a vast organisation which is helping to keep our patients from experiencing preventable blindness as a result of diabetes.

And that's ''99 with a flake, sauce and sprinkles'-level awesome.

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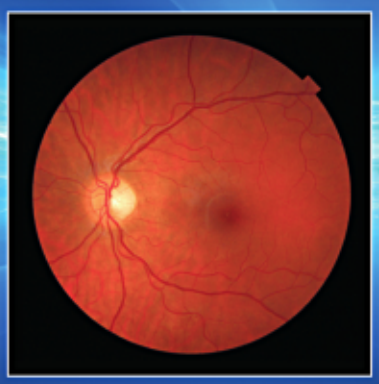

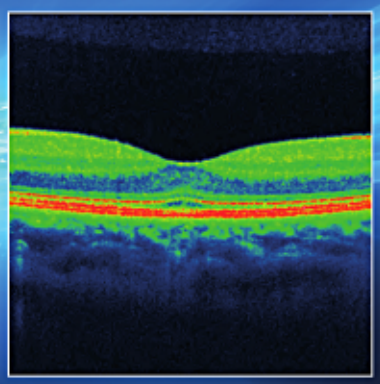

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