*Extract from -* [*EBI\_Guidance\_List3\_0523.pdf (aomrc.org.uk)*](https://ebi.aomrc.org.uk/wp-content/uploads/2023/03/EBI_Guidance_List3_0523.pdf)

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**Optical coherence tomography (OCT) use in diabetic retinopathy referral**

Diabetes can affect the eyes and can cause blindness. People with diabetes have their eyes checked each year through a nationally funded screening programme separate from the optometrist sight test service. 2D digital pictures of the retina at the back of the eye are used to check for any retina problems, however these are not accurate in showing the amount of treatable change (fluid build-up known as oedema) present in the central part of the retina, called the macula. Approximately 50% of patients referred for macular problems on the basis of the 2D pictures do not need hospital treatment.

There is an additional tool called Optical Coherence Tomography (OCT) which uses light waves to take 3D pictures. The detailed images from OCT are much more sensitive and accurate at detecting treatable oedema and so the use of OCT 3D pictures, before attendance at a hospital clinic for macular treatment, can reduce unnecessary referrals.

Currently, diabetic eye screening contracts in England do not include the use of OCT. The EBI programme recommends that the referral pathway for diabetic patients to be seen by hospital eye services is updated across England to include locally commissioned OCT assessments to supplement the NHS England-commissioned diabetic eye screening services.

**Clinical overview**

Diabetic macular oedema (DMO) is the leading cause of blindness in young adults in developed countries. The best way of preventing visual loss in patients with diabetes is early detection and treatment. Every diabetic person in the UK is required to attend (at minimum) an annual Diabetic Eye Screening (DES) where a 2D colour fundus (retina) image is taken. DES services are commonly held in the community or primary care with agreed criteria for referral to HES. Referrals to HES are made if there is a grade of R2 (preproliferative diabetic retinopathy) or R3 (proliferative retinopathy) and/or M1 (diabetic macular oedema/DMO) on the 2D colour fundus image. However, in DMO, leaked fluid builds up at the macula (the central part of the retina) causing swelling/elevation which is difficult to detect on a 2D image. OCT is a non-invasive imaging tool, using light waves to take high resolution cross-sectional 3D images of the retina. It allows accurate detection of DMO and quantification of the degree of oedema through the measure of the central retinal thickness (CRT).

Thresholds for treatment are based on OCT measures of CRT. NICE recommends active treatment of DMO with licensed intravitreal injections in eyes with CRT of 400μm or more. Individuals with non-central DMO or CRT may also be suitable for macular laser treatment. As retinal thickness is essential to make a clinical decision on treatment but cannot be accurately judged with 2D colour fundus image, an OCT is required to decide on treatment.

Current protocols in DES are significantly variable by geography with regards to OCT use. NHS Scotland introduced the inclusion of OCT surveillance in DES in January 2021. However, these changes have not been adopted in England at present.

Therefore, the use of OCT in diabetic maculopathy referral refinement pathways would reduce unnecessary referrals to HES

**Guidance**

This guidance applies to those 18 years and over. The proposed guidance uses best available evidence to propose patients with DES diabetic retinopathy grading M1 or above should have integration of OCT within the DES pathways or as part of a referral refinement protocol prior to assessment in secondary care treatment clinics, in addition to the current fundus photography. Where possible, OCT should be made available within the same appointment as the diabetic screening assessment for efficiency, patient convenience and to reduce patient anxiety.

Referral to / assessment in secondary care face to face treatment clinics should NOT be accepted for any patient with diabetic maculopathy grading of M1 or above without an OCT scan and assessment of images to filter referrals. The OCT scan can be performed at either;

— Diabetic eye screening (DES)

OR

— Local referral refinement.

In addition, patients with low-risk maculopathy below treatment levels should be monitored in OCT-supported assessments outside of routine medically led secondary care clinics.

Integration of OCT imaging into patient pathways can be directly made into the screening programme itself, ideally within the same appointment as the screening assessment, which is the most patient-centred pathway. Alternatively, it can take the form of an asynchronous virtual clinic after undertaking a non-medical (usually technician-led) OCT diagnostic assessment. If not available within the DES setting, the right ‘place’ for OCT capture will depend on local arrangements and availability of resources, such as the imaging equipment, connectivity and commissioning arrangements. It could be conducted at a diagnostic clinic in the hospital eye service, at a diagnostic hub or mobile unit in the community or in primary care optometry enhanced services. If undertaken outside the DES, appropriate failsafe and recall arrangements need to be incorporated. There will need to be local agreements, based on available multidisciplinary clinical decision making expertise and experience, as to where decisions are taken on OCT images and how non-consultant decision makers can access virtual decision support from consultantled hospital teams. It offers an obvious opportunity to reduce the workload and delays in access to the core hospital eye service and avoid unnecessary referrals of patients with diabetic maculopathy to face to face treatment clinics who do not require treatment.

Please note that this guidance is intended as a standard threshold for access. However, if you/ your patient falls outside of these criteria, the option to apply for an Individual Funding Request is still available to you.

**Rationale for recommendation**

Recent data suggests that DES referral criteria with photographic data in the UK is highly successful at detecting diabetic retinopathy and preventing blindness. Using OCT imaging to view retinal layer structures with precision, along with fundal photography, increases sensitivity of detecting DMO and identifies progression earlier, and therefore facilitates earlier intervention and improved outcomes. Referrals from diabetic eye screening for suspected maculopathy (M1) has a high false positive rate of referrals, with 50% of referrals for diabetic maculopathy not requiring treatment. Therefore, incorporating OCT within the referral pathway can improve the sensitivity and specificity, preventing patients who do not need treatment from the anxiety and burden of unnecessary hospital visits.