LEARNING DOMAINS

CLINICAL PRACTICE

SPECIALTY: CONTACT LENS OPTICIANS

PROFESSIONAL GROUPS

Dispensing opticians CPD PROVIDER General Optical Council

Optometrists CPD PROVIDER General Optical Council

Contact lens opticians CPD PROVIDER General Optical Council

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This CPD session is open to all FBDO members and associate member optometrists. Successful completion of this CPD session will provide you with a certificate of completion of one non-interactive CPD point. The multiple-choice questions (MCQs) are available online from Tuesday 1 July 2025. Visit **abdo.org.uk**. After member login, scroll down and you will find CPD Online within your personalised dashboard. Six questions will be presented in a random order. Please ensure that your email address and GOC number are up-to-date. The pass mark is 60 per cent.

CPD CODE: C-112323

Dispensing considerations for patients with common ocular diseases

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According to the Royal National Institute for Blind People[1] more than two million people in the United Kingdom are living with sight loss that affects their daily lives. One million of those have an irreversible eye condition and approximately 320,000 are registered as sight impaired or severely sight impaired[1]. Most people with sight loss are aged 65 years and older, and as the population ages a larger number of people will begin to fall into this category. In addition, ophthalmology is one of the busiest subspecialties in the NHS with 7.5 million outpatient appointments each year[2]. Optical professionals will see a growing number of patients who are suffering from ocular diseases. Understanding the unique set of challenges that common ocular diseases bring will enable optical professionals to optimise their patients' vision and quality of life while minimising remakes and errors. This article will look at the types of ocular diseases and their implications for optical appliance dispensing.

DISEASES OF THE OCULAR ADNEXA

STYES, CHALAZIA AND HORDEOLA

Any form of lid swelling or deformation can apply forces to the cornea and temporarily induce changes in refractive error. Acute lid tenderness accompanied by a visible lump may indicate a hordeolum. Once these encyst, a chalazion forms and both states can cause temporary refractive change – so spectacle dispensing should be delayed until the resolution of signs and symptoms.

Warm compresses and massage will help the process along. If a patient attends for a walk-in dispense, good practise would be to observe the patient. Red lumps and bumps or swelling should be referred to an optometrist for investigation and repeat refraction before dispensing.

Contact lens wearers are at higher risk of microbial keratitis due to the increased bacterial load when styes are present, and so should cease lens wear until acute infection has resolved. For patients with recurrent disease, best practise would be to control the disease, cease lens wear during flare ups, and avoid the use of extended wear in favour of daily wear[3]. Lid hygiene, heating the eyelids and massage should be advised coupled with suitable antibiotic therapy such as chloramphenicol ointment massaged into the lid margins where needed[4].

PTOSIS

A sudden onset of ptosis can be a sign of more serious medical concern, such as Horner's syndrome, and so should be acted on immediately with an emergency referral[6]. Longstanding ptosis can be managed with Lundie loops and ptosis props. Scleral lenses are also an option for those otherwise suitable for contact lenses[7]. Care should be taken when fitting ptosis props to avoid excessively restricting lid closure as this can lead to exposure keratitis.

DISEASE	SPECTACLE DISPENSING	CONTACT LENS DISPENSING
Styes chalazia and hordeola	• Wait until swelling and redness has reduced so induced astigmatism settles	• Cease contact lens wear until resolved due to increased risk of microbial keratitis
Ptosis	• Can be a sign of sinister disease • Seek ophthalmological opinion urgently if new onset. Avoid dispensing if possible • Long-standing ptosis, consider Lundie loops or ptosis props	• Scleral lenses

TABLE 1. Summary of dispensing considerations for diseases of the ocular adnexa

Interestingly, Kim *et al* [5] found that astigmatism increased as the distance between the corneal reflex and the upper lid margin decreased for patients with ptosis. This effect was more pronounced in younger patients with increased lid tension. However, as this study was conducted exclusively within a Korean cohort, the findings are not generalisable to other demographic groups due to the anatomical differences in eyelid structure of Asian and Caucasian populations.

DISEASES OF THE CORNEA AND MEDIA

KERATOCONUS

Keratoconus is a condition that results in the progressive thinning of the corneal stroma in the inferior temporal and central region. The cornea progresses from a dome shape to a cone shape, and this results in high myopia, irregular astigmatism, and degradation to visual quality. It can be unilateral or bilateral, however, a study in 2003[8], showed 50 per cent of non-affected eyes go on to develop bilateral disease within 16 years – with the largest risk being within the first six years.

It usually presents around puberty, progresses until the fourth decade of life and then stabilises[9]. Clinical signs include corneal protrusion, scissor reflex on retinoscopy or oil droplet reflex, Vogt's striae, Fleischer's ring and prominent corneal nerves[10]. Stable keratoconus may be treated with spectacle and contact lens correction.

In the early stages of keratoconus, spectacles may be tolerated and give satisfactory visual acuity. Due to the association of persistent eye rubbing and progression of keratoconus, patients should be advised to cease or avoid this behaviour[11]. In early keratoconus, non-orthogonal meridian spectacle lenses, whereby the main power axes are not 90 degrees apart, have shown some improvement in visual acuity and reduction in image degradation from ghosting in research studies[12,13]. This may be an option for keratoconus management in the future if these lenses were to become commercially available.

Contact lens management for keratoconus includes rigid gas permeable lenses (RGPs) in the form of corneal, mini-scleral or scleral lenses. The liquid tear lens under the contact lens compensates for much of the corneal irregularity[14].

Three-point touch is the fitting technique of choice for corneal lenses in keratoconus. The lens is fitted with light touch at the apex and slightly heavier touch in the mid periphery so there are three points of touch in each meridian, minimising the risk of corneal scarring[14,15].

Where rigid lenses are not tolerated, piggyback systems can be considered. This involves using a soft contact lens with a rigid corneal lens (RCL) over the top. Using a negative powered soft lens provides a flatter corneal topography, potentially improving centration and central oxygen transmission[10] while increasing tolerability.

Where progression is demonstrated, corneal cross-linking may be considered. Corneal cross-linking involves using ultraviolet A (UVA) light to irradiate the riboflavin treated cornea. This aims to increase the corneal rigidity and stop progression. Treatment is usually offered to patients when progression is demonstrated. Progression is defined as:

- Increase in astigmatism ≥ 1.00D within a year
- Significant changes in refractive axes
- Increase of 1.00D or more in the steepest corneal meridian
- Decrease of 25µm or more in corneal thickness[10]

Early detection is key but can be difficult. Dispensing opticians (DOs) are well placed to act as another check for keratoconus by detecting increases in astigmatism and changes in axis during prescription analysis using the criteria above. Contact lens opticians (CLOs) may also detect early signs of keratoconus, particularly through the use of corneal topographers and keratometry.

Following corneal cross-linking, a procedure that uses UVA light and riboflavin (vitamin B2) to strengthen the cornea by forming additional collagen cross links to halt the progression of keratoconus, the patient is recommended to wear UV protection and avoid bright sunlight for a minimum of a week[16]. Refraction can take up to one year to stabilise, although most spectacle prescriptions stabilise after three months[16]. Dispensing advice would be to wait at least three months after surgery and then to warn patients their spectacle prescription may still vary. Multiple refractions over a few days or weeks may be helpful to assess stability for dispensing and avoid remakes.

Soft contact lens wear can recommence after four weeks but RGP wear may commence earlier if sufficiently healed[16].

FUCHS' ENDOTHELIAL DYSTROPHY

Fuchs' endothelial dystrophy (FED) is a condition where symptoms usually manifest at around 50 years of age where the corneal endothelium is less able to pump fluid from the cornea. This results in corneal oedema which appears as increased thickness, lack of clarity, striae, and Descemet's folds[17]. It is usually worse in the morning and can cause a diurnal

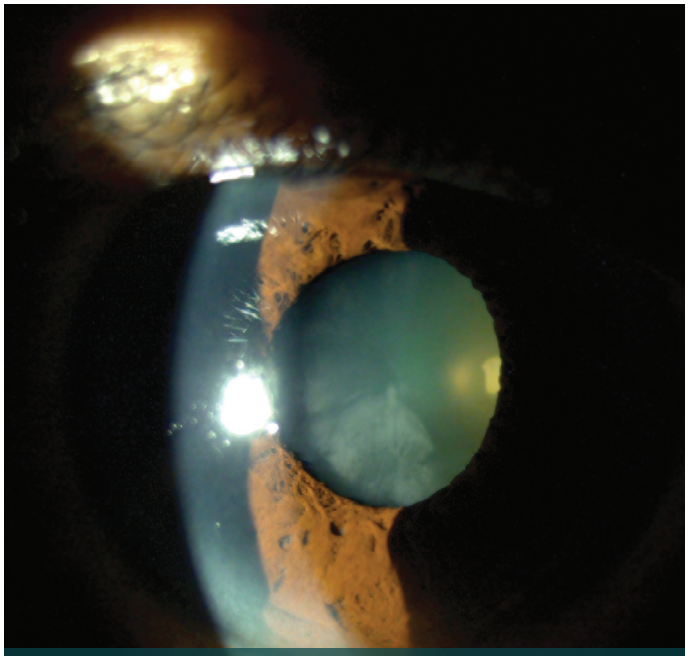

FIGURE 1. Cortical cataract

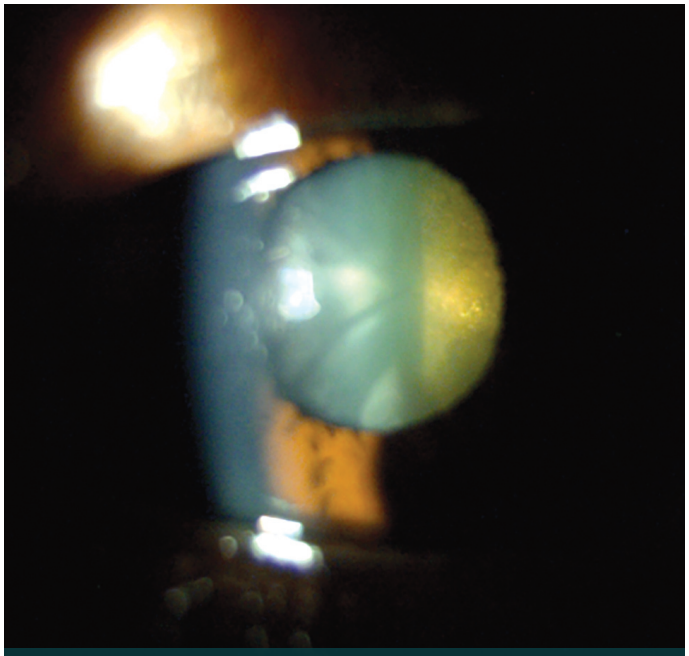

FIGURE 2. Posterior subcapsular cataract

variation in refractive error. Patients with FED were found to have 0.50-1.00D more myopia in 30 per cent of cases and >1.00D more myopia in two per cent of cases in the morning compared to the afternoon. Front loading treatment with sodium chloride (NaCl) drops in the morning may help lessen the variation in refraction; although a recent study suggests it does not accelerate the reduction[18]. Patients should be advised to book their sight test in the afternoon to establish a more reliable refraction and where significant disease is present, multiple refractions may be beneficial to avoid remakes.

Dispensing considerations may include a multi anti-reflection (MAR) coating to limit light scatter. In vitro trials showed UV light induced FED[19] so full UV protection should be recommended. Tints may also be helpful for glare.

Studies have also shown[20] morphological changes to the corneal endothelium with soft lens wear increase with wearing time. For patients with FED, overnight wear of soft lenses is not recommended, and oxygen transmissibility should be optimised.

CATARACTS

Cataracts are the gradual opacification of the crystalline lens. Different types of cataracts can give rise to different symptoms.

Nuclear sclerotic cataracts can often come along with myopic shifts[21,22], and reduced contrast sensitivity[23]. Cortical cataracts have been shown to cause significant changes in astigmatism power and axis[24]. This can, in turn, lead to the appearance of floors sloping[25] and dizziness[26]. Posterior capsular cataracts show minimal refractive changes[22]. **Figure 1** shows a cortical cataract. **Figure 2** shows a posterior subcapsular cataract.

Large changes in refractive error, both as cataracts develop and after cataract surgery, can be difficult to adapt to. Myopic shifts in developing cataracts will increase minification experienced through spectacles and a hypermetropic change after surgery increases magnification. These retinal image size changes can lead to an alteration of foot positioning on steps and hesitancy in the gait cycle – both of which can lead to increased trips and falls[24].

In one study, the risk of falls increased by 114 per cent in between first and second eye cataract surgery, and by 34 per cent in the two years following second eye surgery[27]. Another study[28] found that for patients with major changes in refraction consisting of +/-0.75DS or DC change, 10 degrees axis alteration for 0.75DC and five degrees above 0.75DC, prism or anisometropia above 0.75D, 74 per cent fell at least once versus 53 per cent with minor changes in refractive correction.

Wearing multifocal spectacles following second eye surgery after a long period between surgeries without spectacles increases the risk of falls due to requiring a period of re-adaptation[24].

Following cataract surgery to reduce the incidence of falls, the College of Optometrists[29] suggests:

- Keep cylinder power and axis similar to pre surgery where possible
- Reduce small cylinders and equalise in both eyes
- Consider best vision sphere for low oblique axis cylinders
- Reduce the use of progressive power lenses (PPLs) and bifocals in older active patients
- Where PPLs and bifocals are used for walking, consider a low add pair for outside and a higher add pair for more prolonged reading tasks

Between first and second eye surgery, ensure the patient has appropriate spectacles if:

- There will be a significant wait for the second eye surgery
- They will have significant ametropia
- They will wear PPLs following the second eye surgery to walk about outside
- Consider contact lenses for the unoperated eye

The other consideration is when to dispense. In uneventful cataract surgery, the refraction has been shown to stabilise one week post cataract surgery by some studies[30,31] and two weeks by others[32]. Currently the NHS recommendation is

DISEASE	SPECTACLE DISPENSING	CONTACT LENS DISPENSING
Keratoconus	• UV protection • MAR coatings to reduce glare • Non orthogonal lenses (when available)	• Corneal RGP with traditional three-point touch and good tear exchange • Mini scleral lenses • Scleral lenses
Fuchs' corneal endothelial dystrophy	• UV protection • MAR coatings • Consider polarising sunglasses • Repeat sight tests and afternoon appointments	• Avoid overnight wear and optimise oxygen transmissibility

TABLE 2. Summary of dispensing considerations for keratoconus and Fuchs' endothelial dystrophy

four weeks post-surgery, but reducing this may help with adaptation[24].

Surgery where there is significant post operative cystoid macular oedema such that subretinal fluid is present would make the refraction more variable and should be delayed until the inflammation is controlled. Use of optical coherence tomography (OCT) to guide dispensing decisions may be helpful in this regard for both optometrists and DOs who may be faced with a post-surgery walk in prescription.

Diseases of the cornea and media often cause glare by scattering the light. Offering MAR coatings, light reactive lenses and polarising sunglasses may be considered.

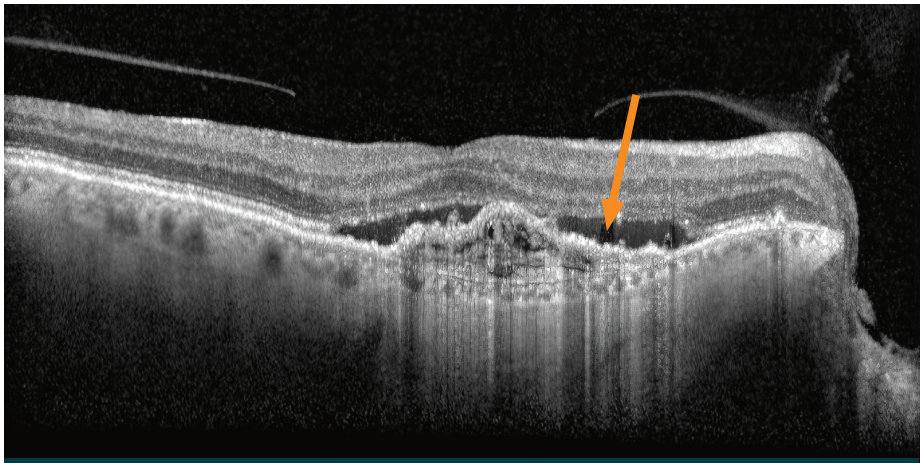

FIGURE 3. Wet AMD. The orange arrow indicates sub retinal fluid

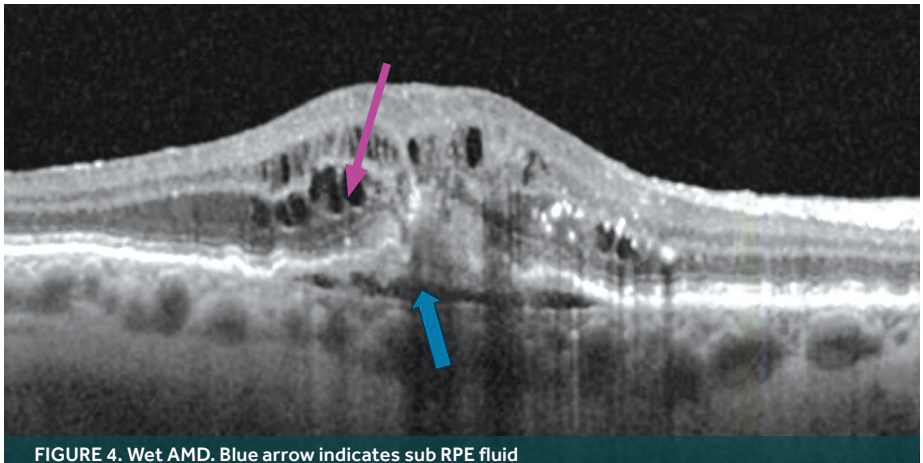

FIGURE 4. Wet AMD. Blue arrow indicates sub RPE fluid and the purple arrow shows intraretinal fluid

DISEASES OF THE RETINA AND MACULA

AGE-RELATED MACULAR DEGENERATION

Dry age-related macular degeneration (AMD) is a slow wear and tear process leading to deterioration of the macula. This leads to symptoms such as gaps and smudges in the vision, faded colours and distortion. Patients may also find bright lights uncomfortable and struggle with glare. At the present time, there is no treatment available on the NHS for dry macular degeneration and so treatment is rehabilitative only.

Wet AMD is where a small mass of blood vessels called macular neovascularisation (MNV) grows in the retina. Type 1 grows under the retinal pigment epithelium (RPE) (sub-RPE space), Type 2 grows in the sub-retinal space, and Type 3 grows intraretinal[33].

While some MNV vessels do not leak, most go on to become exudative[34]. Exudation can be in the form of sub-RPE fluid (under the RPE), sub-retinal fluid (SRF), which is under the neuroretina, or intraretinal fluid (IRF), which is within the neuroretina. Patients may experience distortion of straight lines, blurred patches or a smudge in the vision.

Figure 3 shows the OCT of a patient with wet AMD. The orange arrow indicates SRF. **Figure 4** shows a patient with wet AMD and sub-RPE fluid (blue arrow) and IRF (purple arrow).

Patients are treated with anti-VEGF intravitreal injections such as Lucentis or biosimilars (ranibizumab), Eylea (aflibercept) and Vabysmo (faricimab). This is ongoing treatment, and the patient will often require updated spectacles during the course of their treatment. As SRF develops, the patient may become more hyperopic[35]. Refraction at this point would cause over correction and leave the patient blurred for the distance once the treatment reduces the fluid.

The usual course of treatment is three loading doses[36] with each injection a month apart, followed by a treat and extend protocol whereby the interval in between injections is increased when the OCT is dry. This is often done in two-week extensions so the best time for a refraction is when the OCT is known to be dry.

Following the loading phase, two weeks after an intravitreal injection is the best time for a refraction according to current consensus among medical retina professionals in the author's place of work. If there is any doubt as to whether refraction and dispensing can proceed, an OCT image may be useful.

Where a patient walks in for a dispense, consider the date of the last injection compared to the date of refraction, and work to the two-week rule. This allows enough time for tear film and bubbles to resolve and for SRF and sub-RPE to reduce.

Where patients wear contact lenses, wear should be paused until three days after injection and fresh lenses should be worn upon recommencement. This is to decrease the risk of endophthalmitis by potential introduction of bacteria into an eye that is still healing following injection; although there is a variation in this practice across different NHS trusts. Extended wear contact lenses should be avoided due to the increased risk of infection[3]. Daily disposables would be the first choice for patients undergoing intravitreal injection treatments.

When dispensing a patient with both wet and dry macular degeneration, consideration should be given to minimising glare. Sunglasses, in particular wraparound style or over spectacles, may be helpful to block stray light – but consideration should also be given to MAR coatings and UV filters.

Coloured filters are often posited for use in macular degeneration. Bailie *et al*[37] found coloured filters were subjectively preferred by patients compared to neutral density filters, and they did not reduce contrast sensitivity or VA compared to neutral density filters. Wolffsohn *et al*[38,39] found red and grey lenses reduced contrast sensitivity while yellow and orange increased contrast sensitivity. Red filters also reduced peripheral sensitivity – so yellow and orange appear to be the colours of choice.

For a patient with one eye that sees significantly better due to AMD or any other eye disease, and who is at risk of falls, increased impact resistance is something that may need to be considered to give further security for the remaining vision.

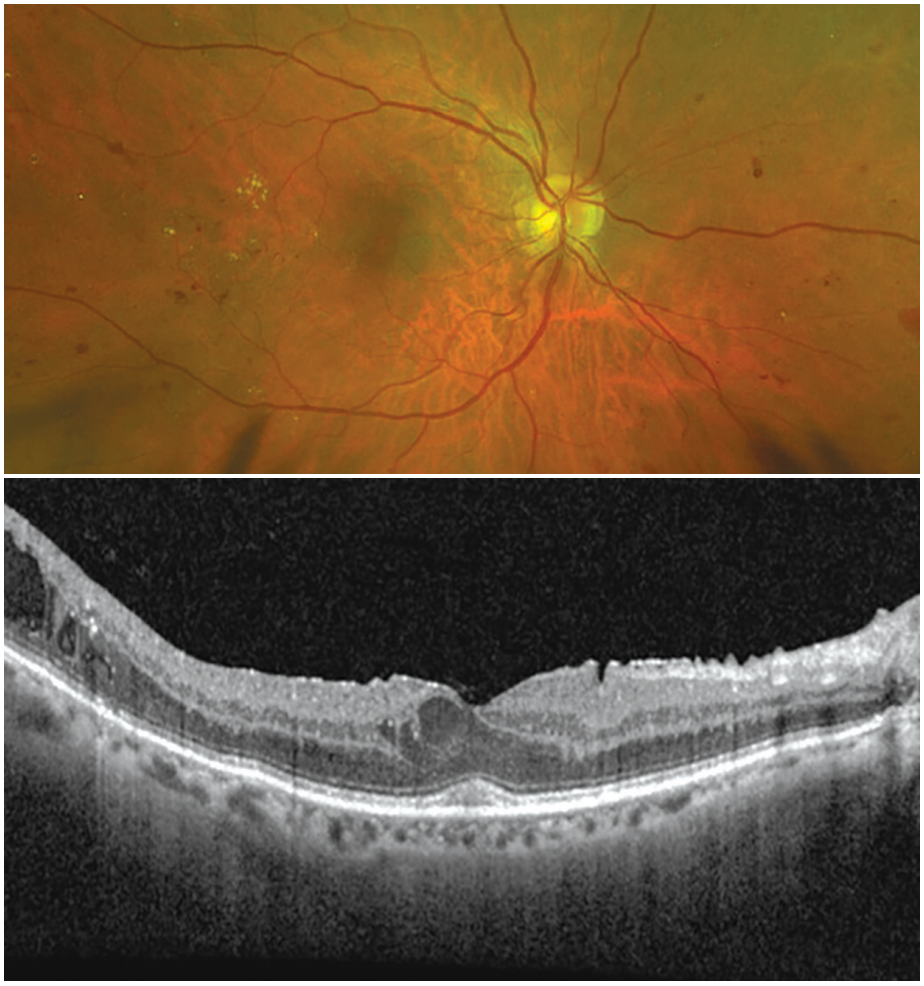

FIGURE 5: Diabetic maculopathy

DIABETIC EYE DISEASE

Figure 5 shows the Optos image and corresponding OCT of a patient with macula oedema secondary to diabetes. The OCT shows IRF leakage at the fovea and non central oedema. Diabetic macula oedema (DMO) arises from oxidative stress and cytokine release caused by high blood sugar. This results in the breakdown of the blood retinal barrier and leakage into the retina[40]. Like wet AMD, DMO is treated with anti-VEGF agents, which help reduce leakage and allow the retina to dry out, thus maintaining the structural integrity of the macula and fovea. DMO can cause glare and so similar general dispensing advice applies as for wet AMD, including MAR and UV protection, wraparound sunglasses and over-spectacles in combination with a wide brimmed hat.

DMO is often in the form of IRF. SRF is often somewhat limited. As a result, the photoreceptor layer is usually flat and so refractive correction does not tend to be volatile during treatment of macula oedema with anti-VEGF agents[41,42]. However, commencement of systemic medication can lead to marked hypermetropic shifts in the region of 0.50-3.75D, with recovery taking between 14 and 84 days. So, asking patients who walk in for dispensing about their general health and changes to medications is a useful conversation to avoid remakes. However, patients undergoing anti-VEGF treatments for DMO with stable medications are unlikely to have refractive volatility.

If there is any doubt and OCT is available, DOs, CLOs and optometrists may want an OCT to be performed. If IRF but no SRF is present, dispensing can in theory proceed. Where SRF is present, it would likely change with treatment and so dispensing should be delayed.

Proliferative diabetic retinopathy (PDR) is a late stage of diabetic eye disease whereby new blood vessels grow. These blood vessels are fragile and can bleed to cause vitreous haemorrhage or fibrose leading to tractional retinal detachments.

Patients with PDR are treated with pan-retinal photocoagulation (PRP) laser.

DISEASE	SPECTACLE DISPENSING	CONTACT LENS DISPENSING
Wet AMD/ dry AMD	• Wait until treatment has stabilised the condition – usually after the three loading doses • OCT to look for fluid can be helpful for walk-in dispenses and to check for stability • MAR • UV protection • Yellow/orange lenses • Wraparound style or over-spectacles • Consider impact resistance for patients with one seeing eye or significant disease asymmetry	• Pause lens wear for three days post injection treatment • Daily disposable first choice of fitting
Diabetic eye disease	• MAR coatings for glare • Yellow and orange tints • Sunglasses that wraparound/over-spectacles • Wait until treatment has stabilised the condition • OCT to look for fluid can be helpful for walk-in dispenses and to check for stability	• Pause lens wear for three days post injection treatment • Daily disposable first choice of fitting • Increased risk of infection and decreased corneal sensitivity

TABLE 3. Summary of dispensing considerations for diseases of the retina

While it is usually successful at halting the proliferation of neovascularisation, it has also been shown to temporarily increase macula oedema[43]. One study[44] found 60 per cent of eyes at six weeks showed increased retinal thickness post PRP. Therefore, it may be concluded that diabetic patients who have recently undergone laser treatment could be at risk of an unstable refractive error, so pausing dispensing for three months – or using OCT to check for SRF at the time of refraction and dispensing – may be helpful. Patients report light sensitivity and glare symptoms, so again MAR coatings, tints and coloured filters in wraparound or close-fitting frames may be of benefit.

Diabetes can also adversely affect the integrity and barrier function of the cornea[45] and show decreased corneal sensitivity and wound healing[46]. Combined with the increased risk of infection, poor glycaemic control this can lead to an increased risk of microbial keratitis[46]. Daily disposable contact lenses would be the choice for soft lenses to minimise the risk of infection.

CONCLUSION

As the number of people suffering from ocular disease grows, DOs and CLOs are more likely to encounter these kinds of patients in their clinical practice. For DOs considering dispensing in the presence of ocular disease, remember that these patients may require specialist recommendations such as in the management of glare or UV protection to counteract the eye's more vulnerable state. This is even more pertinent in cases where patients have unequal vision between the two eyes.

DOs are also able to identify changes to prescriptions and alert other professionals to potential disease states. In some situations, pausing dispensing while conditions are treated may be the best option for the patient – as well as avoiding undue expense to the business in the form of remakes.

REFERENCES

References can be found when completing this CPD module. For a PDF of this article with references email, abdocpd@abdo.org.uk

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LEARNING OUTCOMES FOR THIS CPD ARTICLE

DOMAIN: Clinical Practice

7.1: *Identify ocular conditions and stages of disease progression where dispensing may be contraindicated due to refractive instability and refer appropriately for further examination or treatment where necessary.*

7.5: *Recognise the increased risk of falls associated with large refractive changes including anisometropia that can occur following cataract surgery and provide appropriate spectacle and contact lens options based on current good practice.*

DOMAIN: CL speciality

Identify ocular conditions and treatments that can predispose patients to increased infection risk and consider clinical decision making to mitigate risk including lens material and modality to improve oxygen transmission.

CLINICAL PRACTICE

SPECIALITY: CONTACT LENS OPTICIANS

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