**THE WHEEL**

Dry eye is a chronic condition that will require you to work with your patient to manage it. The wheel symbolises the process of mitigating, measuring, and using that information to inform your management approach. When your patient returns for review, you will gather the information again to understand what or how it has changed and how this may inform further mitigation, measurement and refine your management approach.

**RINGS**

The rings shown in the dry eye wheel symbolise the simplest through to more complex approaches for mitigation, measurement, and management of dry eye, according to severity.

There is plenty you can do to ease the discomfort of dry eye patients through mitigation, measurement, and management, even with no additional investment (bronze outer ring) or limited investment (silver middle ring). As the majority of patients with dry eye have mild to moderate disease, all practitioners need to get involved, referring to specialist centres when needed.​

**MITIGATION**

Triaging with a targeted history and symptoms, as well as conducting a differential diagnosis can allow prophylactic measures to be put in place to limit ocular surface damage.​

Other ocular surface conditions can serve as a trigger for the vicious circle of dry eye disease and lead to discomfort symptoms for patients. Reduce this risk by carefully identifying risk factors such as contact lens wear, digital device use, environmental challenges, and hormonal and medicine changes, as well as assessing the eyes for incidental findings, and manage or refer the patient accordingly.

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**Icon: Questionnaire for Early Identification**

History-taking: Careful history-taking allows identification of dry eye symptoms as well as risks associated with the development of dry eye disease. Modifiable risk factors are especially important to identify, as simple changes in lifestyle can help reduce or eliminate their impact, and promote a healthier ocular surface.

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**Icon: Differential Diagnosis if Symptomatic**

Dry eye disease is just one of many ocular surface diseases. Differential diagnosis helps ensure there aren’t other underlying conditions, such as ocular allergy or infection, responsible for the patient’s presenting symptoms. Treat co-morbid conditions before tackling any residual dry eye disease, to increase the chances of successful outcomes for patients. The TFOS DEWS II triaging checklist quickly and easily helps narrow down the diagnosis and avoid unnecessary clinical visits.

* How severe is the eye discomfort?
* Do you have any mouth dryness or swollen glands?
* How long have your symptoms lasted and was there any triggering event?
* Is your vision affected and does it clear on blinking?
* Are the symptoms or any redness much worse in one eye than the other?
* Do the eyes itch, appear swollen or crusty, or have they given off any discharge?
* Do you wear contact lenses?
* Have you been diagnosed with any general health conditions (including recent respiratory infections) or are you taking any medications?

+ Detailed anterior eye examination differential diagnosis where indicated by answers.

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**Icon: Prophylaxis**

Prophylaxis, such as good hydration, controlling environmental conditions, and ocular hygiene, can help prevent ocular surface damage and resulting dry eye symptoms.

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**Icon: Sleep**

Poor sleep quality and quantity are associated with an increased risk of dry eye disease, especially less than 5 hours sleep per night. Encourage good sleeping habits to help reduce the risk of dry eye symptoms.

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**Icon: Contact Lenses**

Contact lenses can disrupt the tear film and risk causing friction with the ocular surfaces and so should be carefully optimised, especially in those with pre-existing ocular surface disease.

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**Icon: Eye Strain**

Digital screen viewing can exacerbate ocular surface disease, especially more than 4-5 hours a day. The impact can be reduced by taking regular breaks, blink exercises, and positioning screens lower than the eyes.

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**Icon: Environment**

Environmental conditions such as air-conditioning and windy conditions can contribute to dry eye; a review of when the dry eye symptoms are worst can allow for targeting the necessary adaptations.

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**Icon: Hormones**

Hormones regulate many key physiological body processes, so changes can disrupt the precisely balanced tear film. When hormones are changing, a medical review might be warranted.

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**Icon: Medication Review**

Many medications, whether prescribed or over-the-counter, can affect the tear film, so a medication review, in conjunction with the prescribing clinician, might allow for symptoms to be reduced.

**MEASUREMENT**

Diagnosis needs to be a standardised process in order for:​

* Patients to have certainty of their disease and trust in clinicians​.
* Clinicians to have consistency of approach​.
* Authorities to receive robust epidemiological data to plan resource allocation​.

Advanced technology is not required for an indicative diagnosis which can be achieved with a standardised questionnaire and the simple comfort time after blink test. Diagnosis can be aided with an ocular surface damage assessment with ophthalmic stains and assessment of tear film stability and osmolarity.​

Likewise, sub-classification to aid the choice of management can be investigated with blinking (rate/completeness), tear volume, and meibomian gland expression, as well as meibomian gland imaging.

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**Icon: Comfort Time After Blink Test**

Patient blinks and reports when eyes first become uncomfortable – repeat 3 times​.

< 10s indicative of dry eye disease.

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**Icon: Validated Questionnaire**

OSDI score ≥ 13 OR DEQ-5 score ≥ 6.​

Other questionnaires can assist with management choices, but not standardised diagnosis.

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**Icon: Fluorescein Staining**

Minimal fluorescein is applied to the eye; observed between 1 and 3 minutes after instillation​.

> 5 corneal spots diagnostic of dry eye disease.

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**Icon: Non-Invasive Breakup Time**

Patient blinks and keeps their eyes open for as long as possible and the time at which the reflections from the ocular surface distort indicates the tear quality​.

< 10s is diagnostic of dry eye disease.

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**Icon: Osmolarity**

A tiny sample of the tear film is extracted, and the impedance used to assess the osmolarity (saltiness) of the tear film.

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≥ 308 mOsm/L or an inter-eye difference of > 8 is diagnostic of dry eye disease.

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**Icon: Lissamine Green Staining**

Lissamine green strip is wet with saline, with the whole drop retained on the strip for at least 5 seconds to elute the dye; observed between 1 and 4 minutes post-instillation​.

> 9 conjunctival spots diagnostic of dry eye disease.

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Lid margin observed between 3 and 6 minutes.

≥ 2 mm in length and/or ≥ 25% sagittal width (excluding Marx's line) diagnostic of dry eye disease.

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**Icon: Blink Rate & Completeness**

Reduced blink rate or incomplete blinking can cause evaporative dry eye disease.

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**Icon: Tear Meniscus Height**

< 0.2mm indicative of aqueous dry eye disease.

Irregularity suggests poor tear film quality.

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**Icon: Meibomian Gland Expression**

Cloudy, thickened, or no expression on pressure to the lid margin may be indicative of evaporative dry eye disease.

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**Icon: Meibography**

Shortened glands / dropout on transillumination or IR imaging of everted lids may be indicative of evaporative dry eye disease.

**MANAGEMENT**

Management of dry eye requires a staged approach, with more severe conditions often requiring multiple treatments.​

However, the majority of patients can be managed with relatively simple strategies, comprising ocular lubricants and lid hygiene measures.​

Management strategies should be ideally aimed at managing the severity of the disease, in addition to being targeted towards the major underlying reason for the dry eye. Sub-typing of the disease into whether it is aqueous-deficient, evaporative, or mixed in nature, can assist with the choice of treatment.

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**Icon: Lid Wipes**

Eyelid cleansing products can effectively remove lid debris and other irritants from around the eyes and reduce bacteria. Lid wipes are a mainstay of blepharitis management with some containing active ingredients for the control of demodex, specifically.

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**Icon: Warm Compress**

Heat can be applied externally to the eyelids with the aid of a wide range of warm compresses, which may contain microwave-heated seeds or glass beads, or by latent moist heat application delivered via goggles. Heat helps to unblock the meibomian glands and plays an important role in the management of meibomian gland dysfunction, which is the major factor leading to evaporative dry eye.

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**Icon: Blink Exercises**

Reduced blinking during digital device use can result in dry eyes. Training patients how to blink fully, to take regular breaks from near work and to use various methods to remind them to blink regularly can alleviate these issues.

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**Icon: Advice**

It is important to discuss with patients that dry eye disease requires a long-term, ongoing commitment to management and is rarely cured, but rather is managed using a variety of approaches, with careful follow-up with their practitioner being important.

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**Icon: Artificial Tears**

Ocular lubricants remain a mainstay of dry eye disease management. Many different formulations exist, including lipid-based drops to help stabilise the tear film and many preservative-free options, which are advisable for more severe forms of the disease.

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**Icon: Intense Pulsed Light Therapy**

Intense pulsed light, which is used widely in dermatology for the treatment of rosacea and other skin conditions, has also demonstrated benefits in the management of meibomian gland dysfunction.

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**Icon: Pharmaceuticals**

A number of oral and topical prescription pharmaceutical agents are now available for the management of more severe forms of dry eye.

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**Icon: Scleral Lenses**

Growing evidence shows that some patients with dry eye can benefit from the wearing of scleral contact lenses, which hold tears between the lens and cornea/conjunctiva and prevent drying of the ocular surface.

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**Icon: Punctal Plugs**

Punctal plugs can be used to temporarily or permanently block the drainage of tears from the ocular surface by occluding the puncta.