Diagnosis and Classification of Dry Eye Disease

Integrating the TFOS DEWS II reports into everyday practice: a simple reference guide.
Diagnosis and stepped management based on TFOS DEWS II, plus some suggested examples of how to manage different types of dry eye.

Screening

Triage questions + Risk Factor Analysis

Symptomatology (DEQ-5 > 6 or OSDI ≥ 13)

Screening

Triage Questions
Used to rule out other causes of uncomfortable eyes such as allergy, infection and contact lens-related complications.

Risk factor analysis
Assessment of risk factors can help inform management options, and include age, sex, environment and medications.

Diagnostic test #1 Screening
Use the DEQ-5 or OSDI questionnaires to screen for symptoms. A positive score, DEQ-5 ≥ 6 or OSDI ≥ 13, is the first stage of a potential diagnosis of dry eye disease, and is the trigger to conduct further tests.

Homeostasis markers

Non-Invasive Tear Break-up
Time < 10 s. (fluorescein)*

Osmolarity
> 308 mOsm/l, in either eye or interocular difference > 8 mOsm/l.

Ocular Surface Staining
> 5 corneal spots; 9 conjunctival spots; or lid margin (≥ 2 mm length & ≥ 25% width)

Subtype classification tests

Evaporative
• Abnormal lipid + MGD

Mixed

Aqueous Deficiency
• Low Volume

Aqueous deficient

Diagnostic test #2 Homeostasis markers
One positive result in ANY of the homeostasis markers, in addition to a qualifying symptom score, confirms the presence of dry eye disease.

Top Tips!
• No special equipment is required, diagnosis can be confirmed with tear break up time or ocular surface staining.

• The order tests are conducted in is important.
Always move from least to most invasive, and if measuring osmolarity, do so prior to instilling fluorescein.

• Full clinical routine can seamlessly integrate both diagnostic and classification tests, for example: start with looking for lash debris, then assess tear meniscus height, non-invasive tear break up time, osmolarity, ocular surface staining, and finally perform meibomian gland evaluation.

Classification
In order to appropriately treat and manage the patient, the type of dry eye disease present must be established. The subtypes exist on a continuum, with evaporative dry eye being more common than aqueous deficient disease. Many patients exhibit a combination of signs, presenting with mixed dry eye disease.

Tear volume, estimated with tear meniscus height, and meibomian gland assessment are required to classify dry eye disease.

Severity
In conjunction with understanding the type of dry eye disease present, it is important to establish severity. This information helps inform where to begin in the stepped management of the disease, as outlined overleaf.

*only to be used if non-invasive tear break-up not available

Staged Management of Dry Eye Disease

Management steps 1-4 adapted from the DEWS II management and therapy report. Examples of dry eye management by type and severity below are suggested examples of how to put this approach into practice.

### Step 1
- Education
- Environmental / dietary modifications
- Eliminate offending systemic medications
- Artificial tear substitutes, gels / ointments
- Eyelid therapy

### Step 2
- **If Stage 1 options are inadequate, consider:**
  - Non-preserved ocular lubricants to minimize preservative-induced toxicity
  - Tea tree oil treatment for Demodex (if present)
  - Tear conservation
  - Overnight treatments (such as ointment or moisture chamber devices)
  - In-office, physical heating and expression of the meibomian glands (including device-assisted therapies)
  - In-office intense pulsed light therapy for MGD
  - Prescription drugs to manage DED

### Step 3
- **If Stage 2 options are inadequate, consider:**
  - Oral secretagogues
  - Autologous/allogeneic serum eye drops
  - Therapeutic contact lens options (soft bandage lenses; rigid scleral lenses)

### Step 4
- **If Stage 3 options are inadequate, consider:**
  - An extended course of anti-inflammatory therapy
  - Amniotic membrane grafts
  - Surgical punctal occlusion

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### Aqueous Deficient Dry Eye

**Mild**
- Education
  - About condition, management and prognosis
- Environmental / dietary modifications
  - Reducing exposure to drying environments
  - Advice on essential fatty acid intake
- Artificial tear substitutes, gels / ointments
  - While BAK-preserved drops should be avoided, use of alternatively preserved drops is not contraindicated in mild disease
- Non-preserved ocular lubricants
- Tear conservation
  - Punctal occlusion / moisture chamber specs
- Overnight ointment
- Prescription medications for dry eye

**Severe**
- Education
  - About condition, management and prognosis
- Environmental / dietary modifications
  - Reducing exposure to drying environments
  - Advice on essential fatty acid intake
- Artificial tear substitutes, gels / ointments
  - Artificial tears, including lipid-based options
  - Lid hygiene, warm compresses
- Non-preserved ocular lubricants
- Tear conservation
  - Overnight ointment
- Prescription medications

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### Mixed Dry Eye

**Mild**
- Education
  - About condition, management and prognosis
- Environmental / dietary modifications
  - Reducing exposure to drying environments
  - Advice on essential fatty acid intake
- Artificial tear substitutes, gels / ointments
  - Artificial tears, including lipid-based options
  - Lid hygiene, warm compresses
- Non-preserved ocular lubricants
- In-office meibomian gland therapies
- Tear conservation
  - Overnight ointment
- Prescription medications

**Severe**
- Education
  - About MGD
- Lids
  - Lid hygiene: avoid baby shampoo. Use wipes, foaming cleaners. Products with tea tree oil (4-terpineol-T40) for Demodex
  - Warm compresses: use products designed for purpose, avoid face cloths
- Artificial tear substitutes, gels / ointments
  - Lipid-based artificial tears
- In-office therapies
  - Device assisted physical heating and expression of meibomian glands (eg: iLux LipiFlow, and intense pulsed light therapy)
  - Prescription medications for dry eye

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### Evaporative Dry Eye

**Mild**
- Education
  - About MGD
- Lids
  - Lid hygiene: avoid baby shampoo. Use wipes, foaming cleaners. Products with tea tree oil (4-terpineol-T40) for Demodex
  - Warm compresses: use products designed for purpose, avoid face cloths
- Artificial tear substitutes, gels / ointments
  - Lipid-based artificial tears
- In-office therapies
  - Device assisted physical heating and expression of meibomian glands (eg: iLux LipiFlow, and intense pulsed light therapy)
  - Prescription medications for dry eye

**Severe**
- Education
  - About condition, management and prognosis
- Environmental / dietary modifications
  - Reducing exposure to drying environments
  - Advice on essential fatty acid intake
- Artificial tear substitutes, gels / ointments
  - Artificial tears, including lipid-based options
  - Lid hygiene, warm compresses
- Non-preserved ocular lubricants
- Tear conservation
  - Overnight ointment
- Prescription medications

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### Neurotrophic Dry Eye

**Signs without symptoms.** Corneal loss of sensitivity can occur secondary to longstanding diabetes. Not classified as dry eye, but requires patient education, and treatment based on signs found – could include artificial tears, lid therapies, bandage lenses and autologous serum.

### Neuropathic Dry Eye

**Symptoms without signs.** If not malingering or psychological then possible neuropathic pain. This type of pain is caused by a lesion or disease of the somatosensory nervous system. Educate patient on lack of ocular signs and refer for pain management.

### Sjogren's

Sjogren's possible when positive responses to triage questions (dry mouth) and signs of dry eye present. Ocular exam includes Schirmer and Rose Bengal/Lissamine Green staining. Counsel patient and refer for systemic diagnosis. Ongoing management is multidisciplinary.