Dry Eye Disease
What is dry eye? DEWS definition: 2007

- Dry eye is a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface.
How many types of dry eye?
DEWS Categorization

• The main division is by Schirmer scores: less than or equal to 10mm in 5 minutes is considered aqueous deficient dry eye. The extreme is Sjogren’s syndrome

• Greater than 10mm in 5 minutes is considered evaporative dry eye
Classification of Dry Eye

DEWS—Classification of Dry Eye

DRY EYE

Aqueous-deficient

Sjogren Syndrome Dry Eye
- Primary
- Secondary

Non-Sjogren Dry Eye
- Lacrimal Deficiency
- Lacrimal Gland Duct Obstruction
  - Reflex Block
  - Systemic Drugs

Evaporative

Intrinsic
- Meibomian Oil Deficiency
- Disorders of Lid Aperture
  - Low Blink Rate
  - Drug Action Accutane

Extrinsic
- Vitamin A Deficiency
- Topical Drugs Preservatives
  - Contact Lens Wear
  - Ocular Surface Disease eg. Allergy
EPIDEMIOLOGY OF DRY EYE

Against World Population Density

Varikooty, 2004
CANDEES RISK FACTORS FOR DRY EYE DISEASE

- CONTACT LENS WEAR
- ALLERGIES
- DRY MOUTH
- MEDICATION
- GENDER
- AGE
CANDEES RISK FACTORS FOR DRY EYE DISEASE

• HORMONE CHANGES: estrogen, androgens, progesterone

• AUTOIMMUNE DISEASES: RA, lupus, scleroderma, Sjogren’s syndrome

• ROSACEA
Environmental Risk Factors of Dry Eye

Adverse Conditions

Arid Conditions (e.g. Midwest)

Windy Environments (e.g. air conditioning, forced heat)

Pollutants (e.g. exhaust, smoke, smog)
Drugs Causing Dry Eye

- Alcohol
- Barbiturates
- Diazepam (valium)
- Acne meds (acutane)
- Anticholinergics
- Antihistamines
- Beta blockers
- Tricyclic antidepressants
- Oral contraceptives
The basics

Meibomian Glands

Lacrimal Gland

Goblet Cells (in conjunctiva)
## AECC Criteria for Primary SS

4 of 6 items (Serum or Biopsy+)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Symptom or Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Symptom</td>
<td>Dry eye</td>
</tr>
<tr>
<td>2 Symptom</td>
<td>Dry mouth</td>
</tr>
<tr>
<td>3 Ocular signs</td>
<td>Schirmer(&lt;=5)mm OR Rose Bengal(&gt;=4/9) (van Bjisterveld scale)</td>
</tr>
<tr>
<td>4 Histopathology</td>
<td>(\geq 1) focus score</td>
</tr>
<tr>
<td>5 Oral signs</td>
<td>saliva(&lt;=1.5)ml/15min</td>
</tr>
<tr>
<td>6 Serum</td>
<td>anti-Ro OR anti-La</td>
</tr>
</tbody>
</table>

Vitali 2002
American College of Rheumatology Classification Criteria for SS-2011

Patients with signs/symptoms suggestive of SS who have 2 or more of:

1. Positive serum anti-Ro and/or anti-La OR RF+ AND ANA titre ≥1:320
2. Labial salivary gland biopsy with focus score of ≥1 focus/4mm2
3. KCS with staining scores of ≥3
My Job

• Symptoms
• Flow test
• Staining tests
• Lid inspection
• Summary to you of type and level of dry eye disease
Schirmer Test

Conjunctival Staining

Corneal Staining

Lid inspection
Counting the dots

• 1-5 is grade 1
• 6-30 is grade 2
• >30 is grade 3
Lissamine green staining of conjunctiva

- 0-9 is grade 0
- 10-32 is grade 1
- 33-100 is grade 2
- >100 is grade 3
Quality/Stability

TBUT

≥ 10 sec controversial
ethnic differences
(HK/Singapore-Chinese)
Standard procedures
The issue of osmolarity
Assess the meibomian glands
Manage from the inside Out!

- Start with the body
Stop smoking
Move your body!
Modify your environment
If it is dry...wet it!
Autologous Serum Drops

- Use patient’s own serum combined with OTC tears to treat dry eye
- Many growth factors will be found in these solutions
- My experience is that they feel better but do not look better!!!
Work on the Lids: lid scrubs and hot soaks
Lid ointments

- Bacitracin
- Tobradex ointment

- Generally used BID and limited course
Oral tetracycline derivatives

- Tetracycline 250mg, 1-4x day
- Minocycline, doxycycline 50-100 mg
- Try high dose for 4 weeks then cut in $\frac{1}{2}$ for 2 weeks and observe
probing
lipiflow
Anti-inflammatory therapy: the new approach

- Restasis
- Topical “soft” steroids
- Lid ointment combinations
RESTASIS®
(Cyclosporine Ophthalmic Emulsion)
0.05%
Pulsing Steroids
Punctal plugs
goggles
Know what to ask for

• Talk about your symptoms
• Ask for a tear flow test
• Ask about the level of staining on the surface of the eye
• Ask for a treatment plan