# Successful Contact Lens Wear: It Begins with the Ocular Surface

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# Importance of the Ocular Surface

- Quality of life (Miljanovic et al, 2007)

- Improve surgical outcomes

- Economic burden
  - Annual healthcare costs are estimated at $3.48 billion ($783/patient) (Yu et al, 2011)
  - Wage and production losses (Uchino et al, 2014)

- Provide comfortable contact lens wear

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# Contact Lens Market

- Estimated 39.2 million contact lens wearers in the US
  - ~65% of lens wearers are female

- $2.5 billion market

Proportion of CL wearers by age

- 55+ yo, 13.20%
- 45-54 yo, 16.30%
- 18-34 yo, 48%
- 35-44 yo, 22.50%

Nichols, JJ. 2015.

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# Contact Lens Dropout

- **Contact Lens Dropout Rates**
  - Rumpakis: 15.9%
  - Richdale: 24.1%
  - Pritchard: 34.0%

- **Reasons for Contact Lens Dropout:**
  1. Discomfort and/or dryness (most common)
  2. Poor vision
  3. Cost

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# Landmark International Workshops

- The International Dry Eye Workshop (DEWS), 2007
  - DEWS II in the future

- The International Workshop on Meibomian Gland Dysfunction, 2011

- The International Workshop on Contact Lens Discomfort, 2013

The Ocular Surface
2007 Report of the International Dry Eye WorkShop (DEWS)

iovs investigative ophthalmology & visual science
The TFOS International Workshop on Contact Lens Discomfort

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# The Progression of CL Discomfort

"Strugglers" Physical Awareness Visual Disturbance → Reduced Comfortable Wearing Time → Reduced Total Wearing Time → Temporary Discontinuation of Lens Wear → Permanent Discontinuation of Lens Wear (Drop Out)

What proportion of your patients are in each of these categories?

Nichols, et al. 2013. The TFOS International Workshop on Contact Lens Discomfort: Executive Summary

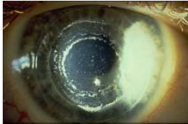## Approach to Contact Lens Patient Management

- Perform thorough medical and contact lens histories

- Choose tests to properly assess the patient's ocular surface status and contact lenses

- Select an accurate diagnosis(es)

- Develop and convey an appropriate treatment and management plan that will result in patient compliance

- Provide follow-up care to assess signs, symptoms, and compliance

## Medical and Contact Lens History

- Medical health history
  - Age, gender
  - Autoimmune conditions
  - Medications (systemic and ocular including glaucoma)
  - Acne rosacea
  - Ocular surgeries (refractive)
  - Seasonal and environmental allergies

- Lifestyle
  - Working environment (humidity levels, time spent on electronic devices)
  - Smoking status

- Contact lens history

## Contact Lens History

- New vs. established lens wearer
  - When is it best to fit a new wearer?
- Hours of wear/day and week
  - Hours: Total, comfortable, and patient's goals
- Overnight wear
- Solution (rub, rinse, or soak)
- Replacement of CL's and case
- Comfort upon lens insertion, lens removal, day 1 of lens wear and last day of lens wear
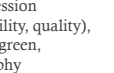  - When is the patient symptomatic (morning, evening)?
- Questionnaires

## Questionnaires

- Ocular Surface Disease Index (OSDI)

- Standard Patient Evaluation of Eye Dryness (SPEED)

- Contact Lens Dry Eye Questionnaire (CLDEQ-8)

- McMonnies Dry Eye History Questionnaire

- National Eye Institute Visual Function Questionnaire (NEI-VFQ)

- Digital device use

## Ocular Surface Related Measurements

- Eyelashes
  - Collarettes, debris   → Epilation (if Ddx includes Demodex)

- Eyelids
  - Telangiectasia, hyperemia, inflammation, thickening, apposition, MG capping, irregularity (notching) of lid margin, lid wiper epitheliopathy, eyelid closure, blinking patterns   → MG expression (expressibility, quality), lissamine green, meibography

- Conjunctiva
  - Staining, hyperemia, papillae, concretions, conjunctivochalsis, pinguecula   → Lissamine green
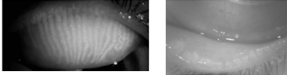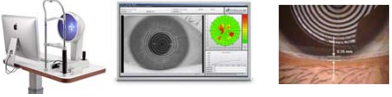
## Ocular Surface Related Measurements

- Tear film
  - Tear break-up time, volume, debris, quality, tear meniscus height, osmolarity, lipid layer thickness   → Fluorescein, Schirmer's test, phenol red thread, Keratograph, TearLab, interferometry, functional visual acuity, Sjo test

- Cornea
  - Staining (location, severity, and depth), keratitis, filaments   → Fluorescein, aberrometry, OCT

## Instruments

- Meibography



- Oculus Keratograph 5M
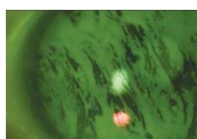


- LipiView II

## Tear Film Analysis

- Biomarker testing: Dry eye patients have fewer protective proteins and elevated levels of proinflammatory markers (MMP-9)
  - Sjo test: Sjorgren's syndrome
  - InflammaDry: Detects MMP-9
  - TearScan Compact: Detects lactoferrin and IgE (dry eye and allergies)



## Diagnosis: One or Many?

- Dry Eye Disease
  - Evaporative
    - MGD: leading cause of dry eye (Nichols et al, 2011, Feng et al, 2014)
      - Number of functional meibomian glands decrease with contact lens wear (Arita et al, 2009)
  - Aqueous deficient
  - Combination
- Sjogren's Syndrome
- Chronic allergic conjunctivitis
- GPC
- Anterior and/or posterior blepharitis
- Demodex
- Instability of the tear film induced by contact lenses

## Treatment and Management

- Ocular surface wellness
- Proper contact lens, replacement schedule, and lens care solution
- Ocular supplements (omega-3)
- Proper hydration
- Eyelid hygiene
- Warm compresses (Bruder mask)
- Meibomian gland expression (Mastrota paddle, meibomian gland evaluator)
- Debridement of the lid margin (BlephEx)
- Artificial tears, gels, ointments
- Steroids (Lotemax gel)

## Treatment and Management

- Antibiotic/Steroid combo (Zylet)
- Cyclosporine
- Doxycycline
- Azithryomycin
- Lipiflow
  - Meibography prior to treatment
- Punctal plugs
- Autologous serum eye drops
- Scleral lenses (Schornack et al, 2014)
  - Moderate to severe ocular surface disease

## Increasing Compliance

- Your presentation of the patient's findings and treatment regimen
- Prescribe a regimen that your patient can realistically follow
- Provide written and/or electronic information of your treatment regimen to the patient
- Follow-up appointments

# Thank you!

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