

***A New Paradigm for Dry Eye and Treatment  
The Academic to the Pragmatic***

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*A one hour course*

**WHY DO WE CARE ABOUT DRY EYE?**

Reasons include: high prevalence; the rapidly changing non-blinking environment with ever increasing use of electronic mobile devices and computers; the average age of onset is decreasing due to lifestyle and now includes children; the public health issue; the aging population; contact lens wear; and surgical outcomes including LASIK, IOLs and multifocal IOLs.

Dry eye is the leading reason for visits to optometrists and ophthalmologists in the US. Dry eye is also the leading cause of contact lens intolerance and discontinuation of wear. Treatment of dry eye has proven to be less than optimal.

A change in direction for the understanding of dry eye etiology and treatment was highlighted by the 2011 Report of the International Workshop on Meibomian Gland Dysfunction summary statement: (IOVS, 2011):

***“MGD may well be the leading cause  
of dry eye disease throughout the world.”***

This paradigm shift from the traditional aqueous and mucous-based models for dry eye to inclusion and emphasis of MGD resulted in an explosion of interest and research.

**EVIDENCE FOR A NEW DRY EYE PARADIGM**

- Etiology
- Diagnosis and treatment
- The ever-expanding role of meibomian gland dysfunction and obstruction
- A new clinical entity, Non Obvious Obstructive Meibomian Gland Dysfunction (NOMGD).

## DIAGNOSIS AND CLASSIFICATION OF MGD

- Normal
- Hypersecretion (seborrheic)
- Obstructive MGD
  - Hyposecretion
  - Frequently non obvious
- Inflammatory MGD (pouting & plugging)
- Infective MGD (glands and/or lids)

## MEIBOMIAN GLAND FUNCTIONALITY

- History of meibomian gland functionality
- Conventional methods of evaluation of meibomian gland functionality
- The art factor in evaluation of meibomian gland functionality
- A recently introduced diagnostic instrument for meibomian gland evaluation,
- Evaluation and quantification of individual meibomian gland functionality
- Correlations of meibomian gland functionality to ocular symptoms and signs.

## RECENT DIAGNOSTIC MODALITIES FOR DRY EYE

- Meibomian gland functionality
- Interferometry
- A new automated Interferometer – the LipiView
- LINE OF MARX
  - A critical new diagnostic tool
  - Anterior, posterior and bisecting – relevance
- LID WIPER EPITHELIOPATHY
  - Relevance to dry eye states.

## NON OBVIOUS OBSTRUCTIVE MEIBOMIAN GLAND DYSFUNCTION (NOMGD)

- The most common form of MGD
- Requires physical expression for Dx
- Relevance of NOMGD to the new paradigm and dry eye

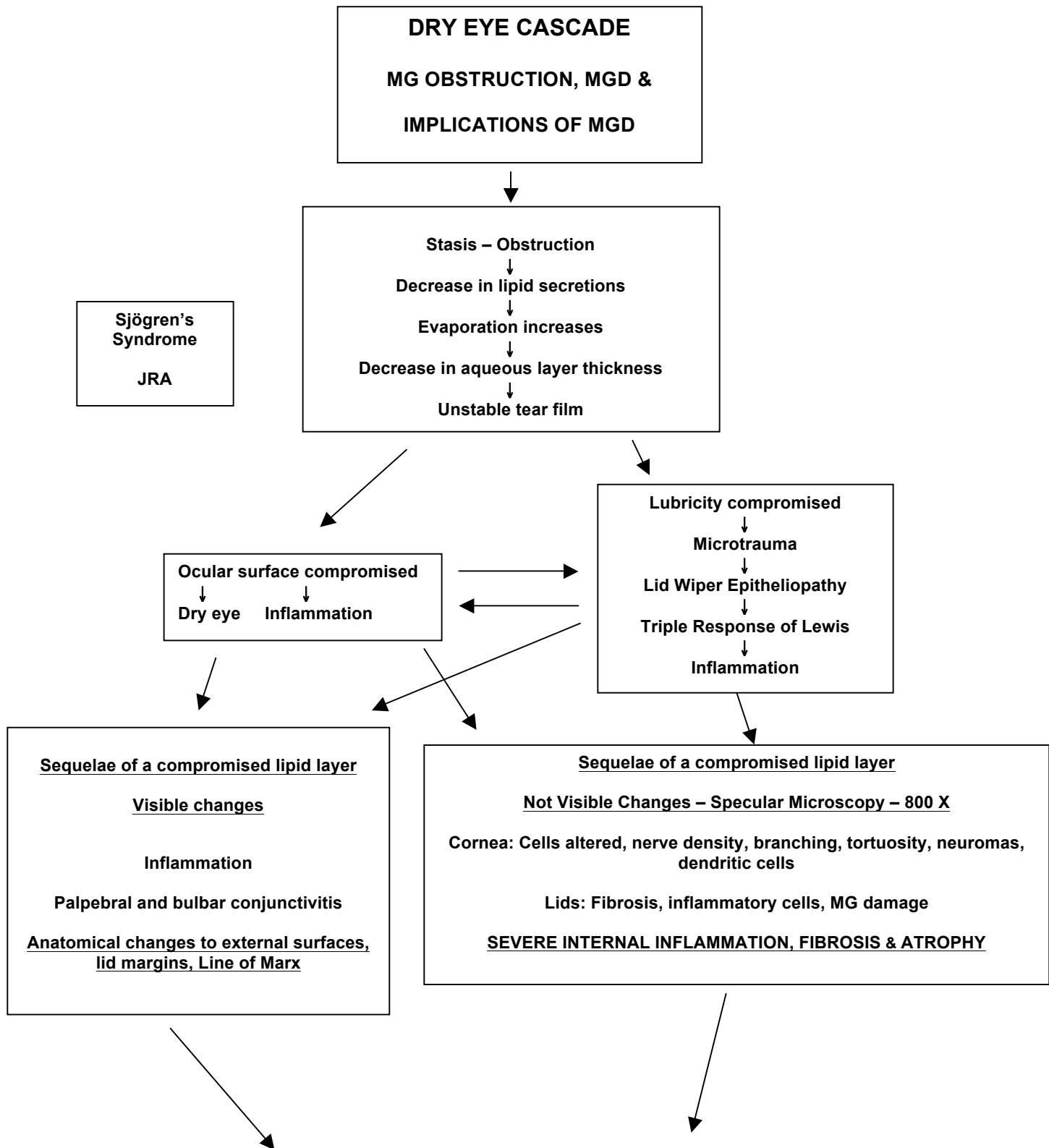
## TREATMENT OF MGD

- Replace the meibomian gland secretions
  - Lipid replacement drops – Systane Balance
- Increase efficacy of meibomian glands & meibomian gland secretions
  - **Warm compresses (WC)** – Increase efficacy of meibomian glands & meibomian gland secretions
- Temperature profiles for anterior and posterior lids during WC treatment
- Lid margin and lash hygienic and therapeutic treatment
- Expression – office treatment
- Limit of expression = PAIN
  - Limits of acceptable pressure in PSI
  - Pain limits specific to individual
- Self-expression
- Commercially available devices for MG treatment
- Role of blinking
- Medications – topical and systemic
- New treatments
  - 2011 – FDA approval of LipiFlow
  - Lid techniques

## SUMMARY – THE DRY EYE CASCADE – A NEW PARADIGM

The author's new model for the Dry Eye Cascade, including a proposed mechanism of action to explain how minimal hyposecretory MGD, frequently non obvious, cascades in to anatomical and atrophic changes of the lids, meibomian glands, cornea, mucous secretory system and lacrimal gland until the magnitude of the changes obscure the root cause – meibomian gland obstruction. This model provides an understanding for the treatment and prevention of evaporative dry eye, driven by MGD, the most frequently encountered and the vast majority of dry eye rather than the traditionally assumed aqueous deficient dry eye.

***The Dry Eye Cascade is initiated by a decrease in meibomian gland functionality, resulting in a decrease in lipid secretion and resulting lipid layer thickness and quality. When the rate of evaporation of the aqueous exceeds that threshold required to maintain tear film stability, a series of sequelae result, with dry eye as an end point.***



Sequelae of a compromised lipid layer

- Does lacrimal gland up-regulate, overwork leading to atrophy?
- Diabetic & adrenal analogues



Treat MGD early to:

Prevent visible and non visible lid and corneal changes

Prevent MGD & Dry Eye

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of dry eye disease throughout the world.”***