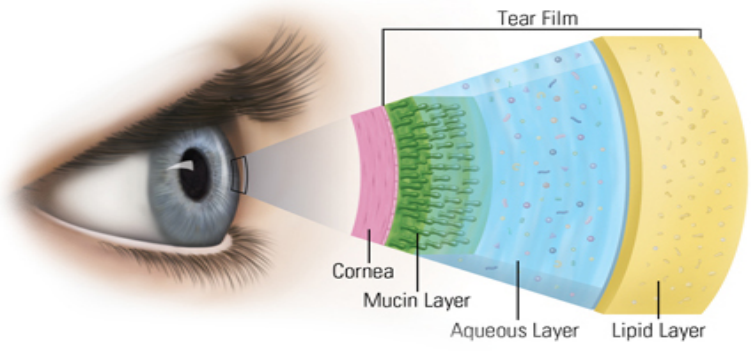
# Dry Eye Disease

Dry eye disease is a complex multifactorial condition of the tears and ocular surface that results in discomfort, visual disturbance and instability of the tear film. Due to the high density of the corneal nerves compared to other tissues in our body, the discomfort that occurs with untreated disease causes significant distress to certain patients who are unable to function normally. Ocular symptoms can include soreness, stinging, burning, watery eyes, tired eyes, fluctuating vision, lids stuck together on waking and occasional transient sharp pains in eyes. Often these symptoms can be exacerbated by air conditioning, windy days, ceiling fans, airplane travel and computer use.

The tear film is composed of many substances including lipids, proteins, mucins and electrolytes. All of these contribute to the integrity of the tear film but their interactions are still being researched. A simplified analysis of the tear film is that it contains 3 main layers. They must all be present in balanced quantities for our tears to effectively moisturize the eyes. The innermost layer that sits against the cornea is the mucin layer. Next is the aqueous layer. This is secreted mainly by the lacrimal gland. It is very rare for this gland to function abnormally. The outermost layer is the oil or lipid layer.
The two main forms of dry eye disease are Aqueous Deficient Dry Eye (ADDE) whereby the aqueous tear volume produced is reduced and Evaporative Dry Eye (EDE) whereby there is a normal aqueous tear volume however an increased evaporation of the tear film occurs. Patients can have any form or sometimes combinations of both forms causing their symptoms. Many different factors can have an impact on these two main types of dry eye.

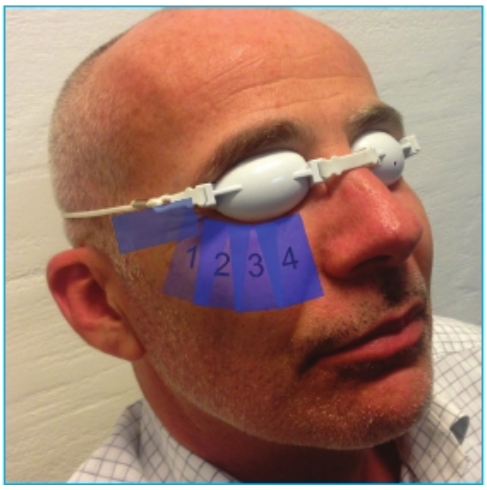


Whilst many factors can cause dry eye disease, **the most common is Meibomian Gland Disease**, which causes Evaporative Dry Eye. The Meibomian Glands are the oil glands within our superior and inferior lids that make the meibum (oil) for our eyes. This stops our tear film from evaporating at an accelerated rate. Left untreated this condition will continue to worsen to the point where the meibomian glands will suffer chronic changes affecting the quantity and quality of the oil they produce and eventually Meibomian Gland dropout.

Till relatively recently the use of standard protocols to address this has brought about an improvement for some patients however the challenge with the ongoing therapy has often proved too much for most patients.

The advent of **Intense Pulsed Light** technology which emits polychromatic light extending from the visible (515nm) to the infrared spectrum (1200nm) has shown remarkable results translating to improvement in quantitative analysis of the non-invasive tear break up time (of the order of 85%), however **more importantly, a corresponding significant reduction in ocular discomfort due to dry eye disease**.
**Please note that for 15% of patients who undergo therapy there is no improvement in symptoms.** It is unfortunately not possible to identify these patients at the outset of treatment.

This protocol involves 4-5 flashes of Intense Pulsed Light under the eyelids of both eyes with the patient having protective goggles on. **The procedure is very safe** with the only people not being suitable in terms of skin color being those with Fitzpatrick Skin Type 6 which equates to those who are very dark brown or black. Other patients who may not be suitable include those with xeroderma, lupus disease, pregnant, tattoos around their eyelids or cheeks, keloid scarring under eyelids and those on systemic tetracyclines. A comprehensive checklist of other medications that can cause potential photosensitivity are discussed and potential patients will have a precautionary skin test with the IPL applied to the underneath of their forearm with follow up evaluation in 48-72 hours to check if any signs of photosensitive reaction have taken place.




Another critical factor that is examined prior to any treatment is **Meibography** whereby the Meibomian Glands are assessed with infrared light via the slit lamp biomicroscope. This allows for a detailed viewing of any meibomian gland changes especially those with significant gland dropout due to chronic untreated disease. These patients would be counseled as to the reduced chance of IPL benefitting them.

Once consent has been given, **treatment consists of a minimum of 4 sessions over a 2-3 month period to maximize the success of the IPL therapy**. These occur at **day 1, day 15, day 45 and day 75**. **It is beneficial prior to treatment to start taking high quality Omega 3 supplementation**. Patients will benefit from a yearly top up treatment to keep the glands flowing optimally.

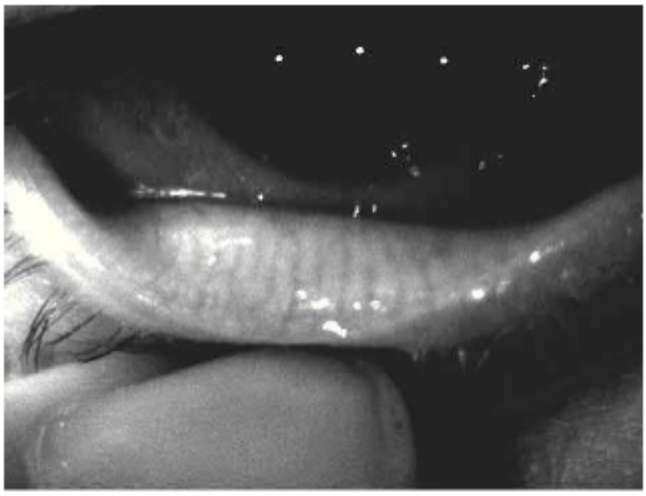
The treatment is painless and no needles or injections are required. You will feel a “warmth” on the cheeks and lids.

**You must NOT wear make-up or sunscreen to your appointment when having IPL but you may put it on after the treatment.**

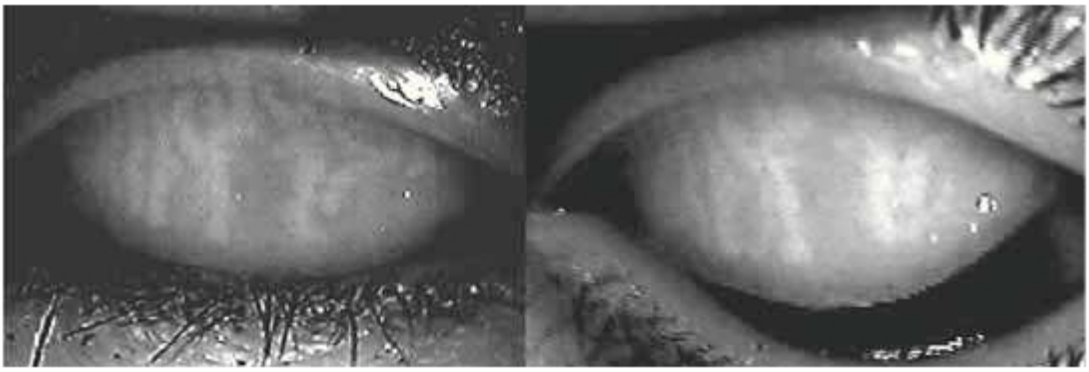
## Additional Methods of Investigation

### Meibography

*Normal Meibomian Glands viewed with infrared light*



*Meibomian Gland Dropout*



## Treatment Notes

**Minimum of 4 sessions needed**

Costs are inclusive of Meibomian Gland Expression at each treatment.

**Unfortunately, there is no Medicare or Private Health Fund Rebate associated with these treatments.**

It is necessary to weigh up the cost of treatment not only with the potential improvement in dry eye symptoms but also the reduction in costs associated with dry eye medication.

A YouTube Video from A Current Affair is beneficial in seeing the treatment being administered. A Google search of E Eye IPL is sufficient to access it.

**Eyecare Plus Clifton Beach**
www.eyecareplus.com.au/cliftonbeach
**Dr Shane Mortier (Optometrist)**
**(B.Optom.Hons Class 1.Grad.Cert Ocular Therapeutics)**
**Phone (07) 4059 1444**

### Works Cited

Jennifer P Craig, Y.-H. C. (2015). Prospective Trial of Intense Pulsed Light for the Treatment of Meibomian Gland Dysfunction. *Investigative Ophthalmology & Visual Science , 56* (No.3), 1965-1970.