We all take good care of our teath. Brush them every day to prevent excess bacteria and tartar growth. If we do not clean our teath, we lose them.

What about our eyelashes?

We know that there are natural oils and bacteria grow on our eye lashes. If the bacteria increase in number then they produce exotoxins such as lipase that will break down our tearfilm and cause excessive evaporation. This results in Dry Eye Disease.

My argument is that we should use daily eyelid hygiene like brushing our teath. A simple rub of the lids using a bottle of cleanser or a pre-packed wipe is all you need.

We are born with a set number of meibomian glands – if we do not take care of them we will lose them. Then it is lifelong lubricating eyedrops, possibly 2 hourly or even more frequently!

Cleaning the lids is a MUST for people who already have Dry Eye Disease!

Why are Antibacterial Hot compresses such an important evolution in managing Dry Eye Disease?

We know that meibomian gland disease is the leading cause of Dry Eye Disease.

The main step to manage this disease is to heat the eyelids. There are a number of products that are available for patients to use. The orignial products were grain filled bags that were heated, applied to the lids, then removed and put into storage overnight. The next day they are warmed in the microwave and then reapplied to the eyelids.

The problem was that overnight the bacteria multiplied on the hot compresses whilst being stored. The patient then applies this contaminated hot compress back onto their eyelids. I believe that cross-contanimation and increasing the amount of bacteria (Bacterial load) are significant risks to the patient.

Some manufacturers have ignored this issue completely and others have advised that patients first microwave their hot compresses, then let it cool completely then microwave it again in order to use it. Whilst this method shows some reduction in bacterial load the remaining organisms are still at an eye-wateringly high level. Others advise regular discarding and replacement of the device.

The revolutionary solution, patented by The Body Doctor Ltd, was to incorporate an antibacterial element into their hot compresses. They then performed detailed scientific studies to evidence the efficacy of their solution. They have shown that during storage, the non-antibacterial hot compresses allow for continued bacterial growth. Their innovative solution, Sterileyes, actively reduces the bacterial load during storage killing 99.9% of bacteria tested.

The net effect is that there is a product that is simpler and safer to use.

Many people store their hot compress in the bathroom or other moist environments. A hot compress is used around the nose area. As we are all aware there is a very high risk of contamination from coughing or droplets that can lead to contamination of other bacteria onto the hot compresses. This can potentially cause contamination of the eyes with bacteria that are not commonly found in the eyes but from the throat or nose. We would consider it common sense that it is preferable to use a device with less bacteria from the nose or other droplets.

We also have the following scientific evidence to support this idea that using eyelid masks with less bacteria is safer than using eyelid masks with more bacteria.

There is research showing that **reducing the bacterial load in subjects with anterior blepharitis or MGD significantly improved the clinical picture** of the eyelid margin tissues including the Meibomian glands. (1)

It is argued that **in order to treat Meibomian gland disease you need to reduce the bacterial load** – indeed Suzuki T propose that systemic (tablets) antibiotics are required for treatment to be successful. (2)

In this article (3) Zhang et al show that it is clear that **in conditions such as dry eye disease there is an increase in the number (Higher culture rate) of bacteria**. They conclude that this contributes to the disease process.

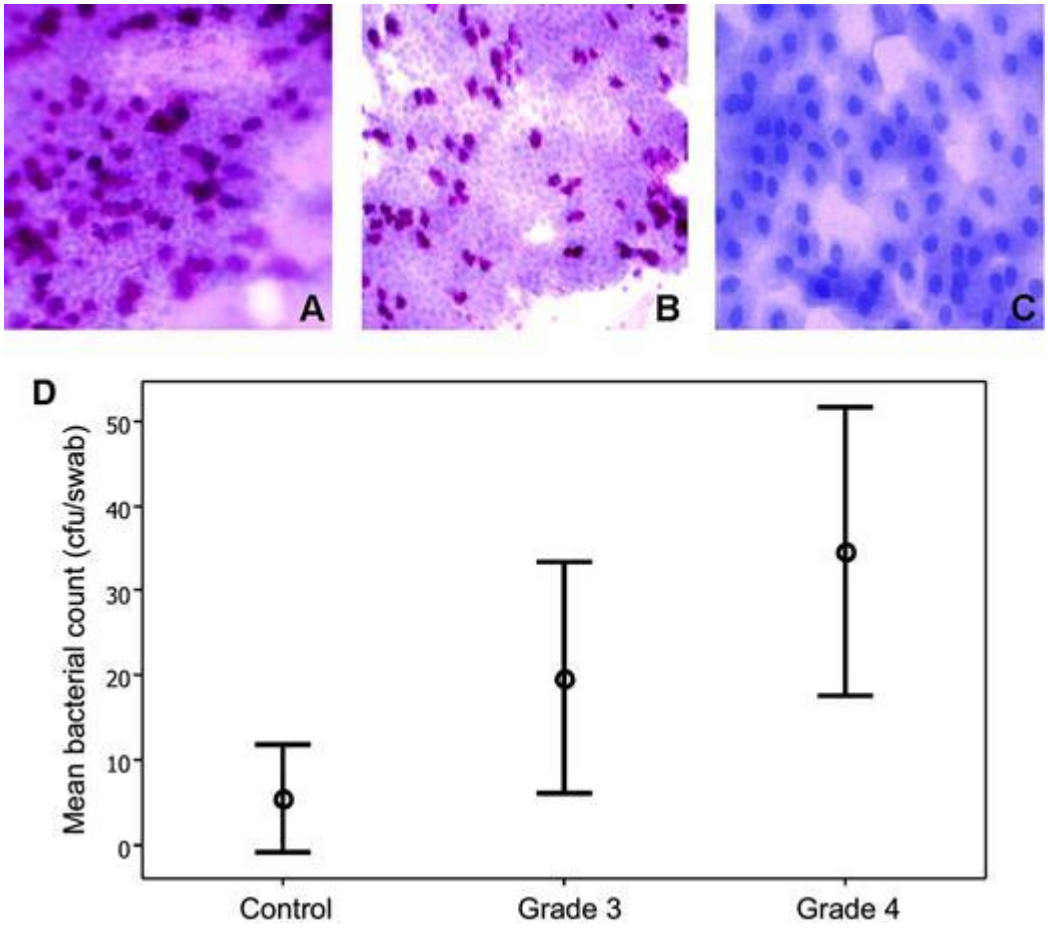
It has also been shown that **'*the severity of MGD was positively correlated with a higher isolation rate, a greater number of bacterial species, and a higher grade of bacterial severity, which implied that MGD might be correlated with bacterial changes.*'** (4) This study also supports the use of antibiotics which some practitioners use commonly in clinical practice.

When looking at the difference in bacteria between healthy people and people with Meibomian Gland Disease, it was found that **those suffering from Meibomian gland disease have a higher bacterial load.** The bacteria produce specific toxins that can contribute to dry eye disease. (5)

If we divide patients with Meibomian Gland disease based on severity of their disease such as mild, moderate and severe. It has been shown **that those with the most severe disease had the highest level of infection of Staphylococcus bacteria.** (6)

It is recognised that **contamination of hot compresses** used as management for Meibomian gland disease **may "exacerbate" this condition**. (7)

The table below from Graham et al. beautifully illustrates the increase in bacterial colony count between normal (control), moderate dry eye disease (Grade3) and more severe dry eye disease (Grade 4). (8)



(A) Photomicrographs of representative conjunctival IC specimens stained with periodic acid-Schiff. (A) Grade 2: a normal control cytologic profile with a high number of goblet cells present. (B) Grade 3: a reduced number of goblet cells. (C) Grade 4: distinct squamous metaplasia of the conjunctival epithelium and complete absence of goblet cells. (D) Interval plot of the mean bacterial count (with 95% CI) in a subgroup of 27 subjects with different IC grades (control, n = 9, grade 3, n = 9; and grade 4, n = 9). There was a significant difference in the mean bacterial counts (cfu/swab) between the control group and the grade 4 group (P = 0.005). Magnification: (A, B) ×200; (C) ×400.

It is **abundantly clear that the higher the bacterial load in the eye, the more likely it is that their dry eye disease will be more severe.** This is also supported by the use of antibiotics to treat this disease and the fact that hot compress manufacturers advise on the importance of reducing the bacterial load prior to using their devices.

We are therefore confident to say that the device with the lowest number of bacteria will be the best product to use.

Can dry eye disease cause blindness?

Yes, Dr Colin Parsloe believes that this link has been shown in reports such as the DEWS report of 2007, other references to this can be found in certain textbooks (10) and in popular optometry and optician journals.

It has been agreed in informal discussions between Eye Care Specialists that there is an increased risk of infection of the cornea in patients with Dry Eye Disease. It is agreed that there are three principle mechanisms at play.

- **Firstly** that in Dry Eye Disease the tears have a poor quantity and quality. The protective proteins in the tears are disrupted and less effective
- **Secondly** the physical barrier or the very thick mucus layer on the surface of the eye is degraded. This allows bacteria direct access to the surface of the eye.
- **Thirdly**, direct damage to the protective surface epithelium will allow bacteria to enter the cornea.

The link between Dry eye Disease and loss of vision from Microbial keratitis is not an absolute as there are other innate immune mechanisms that do assist to protect the eye, however, it is believed that having Dry Eye Disease, and in particular severe Dry Eye Disease, is a risk to developing corneal infections.

Dry eye Disease - This is the most common eye disease in the world. "*The reported prevalence rates based on clinical signs in populations over the age of 40 ranged from 38 to 68%*" (9) In general it is considered to affect around 20% of the general population however this is higher in woman, Asian populations and is significantly higher in people over the age of 40.

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