

# LIGHT THERAPY IN MANAGING MEIBOMIAN GLAND DYSFUNCTION

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For many years, the application of a warm, wet wash cloth over the eyes for several minutes, a few times per day over the course of several weeks (if not

indefinitely) was the common recommendation to patients with meibomian gland dysfunction (MGD).<sup>1</sup> The general consensus among clinicians, however, was that the lack of standardization in heating tools and duration and frequency of application might have resulted in inconsistent results and, therefore, poor patient adherence to recommended therapy.<sup>1</sup>

MGD is present in as much as 86% of dry eye patients and is associated with a change in the quality and quantity of the oil secretions from the meibomian glands.<sup>2</sup> Screening for these patients can be as simple as a slit-lamp examination of the lid margins and evaluation of the meibomian gland oil quality and expressibility with applied pressure. Some practices use tear film interferometry to confirm a reduction in tear film oils or meibomian gland imaging to confirm ghosting, truncation, and/or atrophy.<sup>3</sup>

If meibomian gland architecture appears present on meibomian gland imaging but gland diagnostic expression provides little yield, there might be blockage in the glands. Heat therapy is recommended for these patients because the melting point of the abnormal meibum with MGD is nearly 4°C higher compared to healthy meibum (Table).<sup>4</sup> To make matters worse, the average temperature of the tarsal conjunctiva of MGD patients is lower than the average of normal patients.<sup>5</sup> With the optimum melting temperature of MGD meibum reported

**TABLE.** Comparison of characteristics of patients with and without meibomian gland dysfunction (MGD).

	NORMAL (°C)	MGD (°C)
<b>Meibum Melting Point<sup>4</sup></b>	28.9	32.2
<b>Eyelid Temperature<sup>5</sup></b>		
Upper Eyelid	34.3	32.4
Lower Eyelid	34.3	32.7
<b>Optimum Therapeutic Temperature<sup>6</sup></b>	40.0	41.5

at 41.5°C and reports of some at-home heating therapies delivering between 37-40°C on the inner tarsal conjunctiva, an argument can be made that at-home therapies might not be enough to liquify and mobilize inspissated meibum.<sup>6,7</sup>

One in-office procedure for melting and mobilizing abnormal meibum in those glands that we have had success with is the Systane iLux (Alcon; Figure 1). We recommend this procedure to patients when meibomian gland secretion quality and quantity is low on examination and a sufficient number of glands are visible on imaging. The light emitting diode (LED) technology works by emitting light that gets absorbed by pigments (melanin and hemoglobin) in the eyelid. The pigments convert the light energy to heat, which is then transferred to the surrounding tissues, including the meibomian glands. The Systane iLux emits light at two wavelengths (568 nm and 850 nm), as each wavelength targets specific pigments and depths of penetration. The device heats the eyelid to 40-42°C and maintains it above 40°C during the heating period, which can be 40 seconds or more. After the heating phase, the built-in expression function immediately follows, allowing efficient mobilization and evacuation of the abnormal meibum, without losing temperature. The immediate transition from melting to expression enhances the efficiency and efficacy of the treatment.

Our patients have success with the treatment, and the results in our practice have been consistent with recently published data showing that Systane iLux can be effective in improving meibomian gland secretion scores and symptoms by as early as 1 week after treatment (Figure 2).<sup>8</sup> Patients reported that frequency and severity of burning, dryness, eye fatigue, and soreness symptoms were reduced by 1 week after treatment.<sup>8</sup>



Figure 1. Systane iLux.

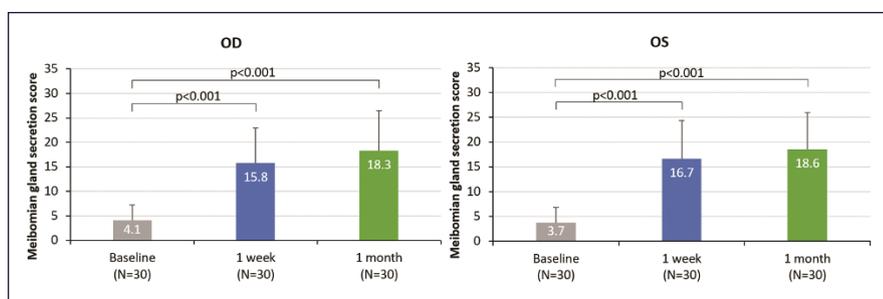


Figure 2. Improvement in meibomian gland secretion score seen by 1 week after Systane iLux treatment.

Meibomian gland secretion scores (MGSS) were increased almost 3-fold on a scale of 0-45, with zero representing no secretions.<sup>8</sup> When efficacy was evaluated over time against TearScience LipiFlow Thermal Pulsation System (Johnson & Johnson Vision), Systane iLux was non-inferior to LipiFlow at all timepoints, including 12 months.<sup>9</sup> For the Systane iLux treatment group, the average severity of symptoms was in the moderate range at baseline and was in the mild range at 12 months (Figure 3).<sup>10</sup>

Furthermore, the mean meibomian gland secretion score changed by >12 units by 2 weeks and >16 units by 12 months.<sup>9</sup> These results show that an in-office treatment like Systane iLux can provide therapeutic and sustained level of heat to effectively melt MGD meibum and improve symptoms quickly.

Systane iLux<sup>2</sup>, which is the latest version of Systane iLux, has a high-resolution display and image and video capture capabilities, including infrared imaging of the meibomian glands. Having a portable handheld device to image, educate, treat, and

monitor MGD patients means that clinicians and staff can now offer effective MGD treatments in a space-saving, staff-efficient, and resource-friendly way.

MGD can be debilitating for many people, including contact lens wearers, preoperative and postoperative patients, and digital device users. We recommend identifying and managing MGD early and aggressively. An in-office heating and expression treatment, like Systane iLux, can help kick-start an MGD patient's journey to recovery. ■

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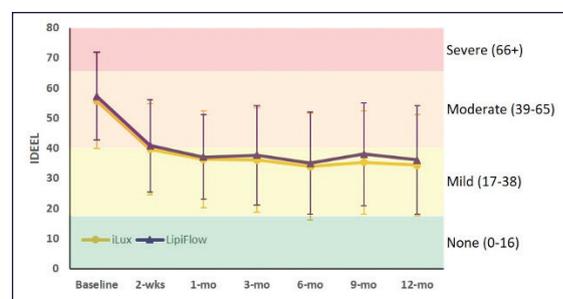


Figure 3. Changes in IDEEL Symptom Bother score over 12 months for Systane iLux and LipiFlow.

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#### IMPORTANT INFORMATION FOR SYSTANE® ILUX2®:

**Indication:** The Systane® iLux2® is indicated for the application of localized heat and pressure therapy in adult patients with meibomian gland dysfunction (MGD), which is associated with evaporative dry eye, and to capture/store digital images and video of the meibomian glands.

**Potential Adverse Reactions:** Potential adverse effects may occur because of the procedure. These effects include but are not limited to, the onset or increase in: eyelid/eye pain requiring discontinuation of the treatment procedure, eyelid irritation or inflammation, temporary reddening of the skin, ocular surface irritation or inflammation (e.g., corneal abrasion, conjunctival edema or conjunctival injection

(hyperemia)), and ocular symptoms (e.g., burning, stinging, tearing, itching, discharge, redness, foreign body sensation, visual disturbance, sensitivity to light).

**Attention:** Please refer to the User Manual for a complete list of contraindications, instructions for use, warnings and precautions for the Systane® iLux2®.