

What are Meibomian Glands?

Meibomian glands are modified oil glands that are arranged side by side in the eye lid. There are about 30 glands in the upper lid and 25 on the lower lid of each eye. These glands secrete an oil called Meibum. The force of your blink causes the meibum to be pushed onto the lash line. This oil initially protects the eye lids from breaking down from the moisture and creates a seal when the eyes are closed. As the oil interacts with the tears, it helps to spread the tears evenly across the eye, maintaining a consistent quality of vision. The oil also covers the tears, which keeps the tears from evaporating too quickly.

What is MGD?

Meibomian gland dysfunction occurs when the glands are not functioning properly. It can occur because of changes in the oil production as we age, as a result of poor diet, as a consequence of skin disorders such as rosacea or seborrheic dermatitis, or even because of poor eyelid hygiene. With Meibomian gland dysfunction, patients may not show any symptoms in the beginning, but eventually vision is affected because there is poor quality oil or too little oil in the tear film. This causes tear film instability, high tear osmolarity (too salty tears) and quick evaporation of the tears. Though dry eye itself may be caused by the excessive tear evaporation, the inflammation involved with dry eye irritation is actually worsened by the tears being too salty.

What to Expect During Your Dry Eye Exam

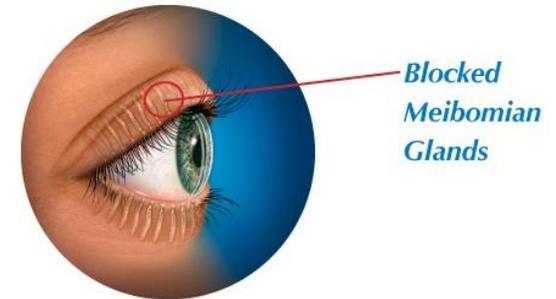
A full dry eye workup takes about 30-45 minutes. We start with a short questionnaire to determine what symptoms you're experiencing, how long you've been experiencing those symptoms, and if you have tried anything to relief your dry eye issues, such as drops. Using that questionnaire, we can determine how to proceed and what diagnostic tests we can perform:

- The LipiScan Meibomian Gland Imager allow us to view the oil glands to look for blockages and shortening of the glands.
- The Schirmer's test evaluates how quickly your eyes can produce the watery layer of the tears. This is done by evaluating how far your tears travel down a piece of filter paper after 5 minutes.
- The TearLab System is designed to test the saltiness of your tears, which causes the redness and irritation using a small sample of your tears. \$70
- Gland expression is the best way for our doctors to see the quality of the oil you're producing and to find specific glands that may be blocked. We simply squeeze the glands to push the oils out.
- We also test your tear breakup time to measure how quickly your tears evaporate by placing a florescent dye on the eye surface and observing.
- Finally, we use a test called InflammDry, that looks for inflammatory proteins in the tear film. \$70



MGD

Meibomian Gland Dysfunction

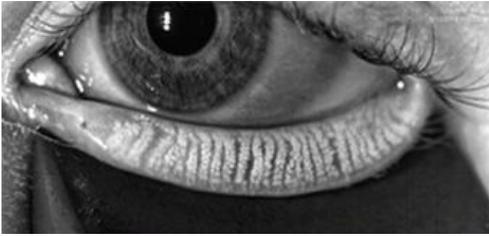
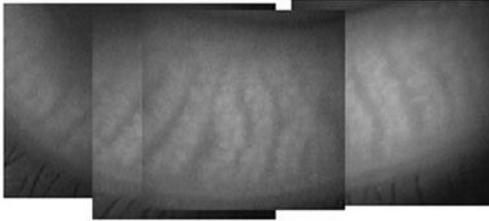


Meibomian gland dysfunction is blockage or some other abnormality of the meibomian glands so they don't secrete enough oil into the tears. Because the tears then evaporate too quickly, MGD is a leading cause of dry eye syndrome. It also is associated with an eyelid problem called blepharitis.

For more information on MGD, dry eye, and the treatment options available, please visit our website!

www.AlaskaDryEyeCenter.com

Stage 1

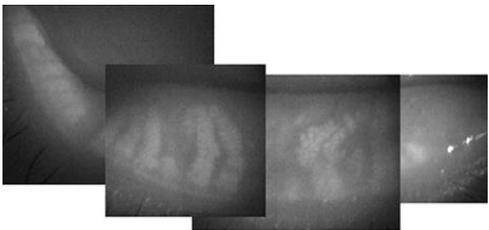


In Stage 1 of meibomian gland loss there are virtually no symptoms of dry eye, like discomfort or itching. However, there may be some clinical signs noted by the doctor. This can include abnormal secretion of the oils and difficulty expressing, or squeezing, the glands. In this stage, it's important to begin at-home treatment to prevent a progression into the later stages

of the meibomian gland dysfunction. At stage 1, consider using hot compresses to keep the glands open and lid hygiene to keep the lash line clean to prevent blockages from forming, as well as taking an omega-3 vitamin to encourage healthy oil production in the glands.

Stage 3

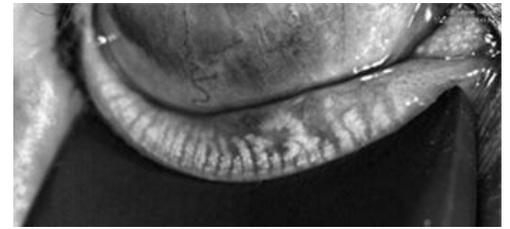
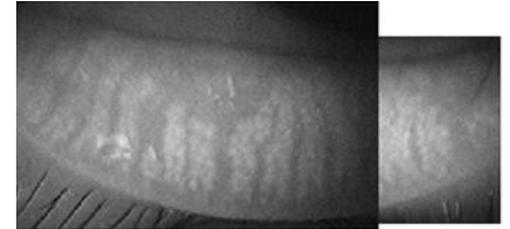
At stage 3 gland dysfunction, your glands are struggling to maintain oil secretion. You are likely experiencing a wide range of symptoms, including redness, burning, itching, vision fluctuating, redness, watery eyes, eye



fatigue, and a sandy/gritty feeling. Dry eye treatment is very necessary at this stage. Due to the lack of oils on the eye, you can begin to experience damage to the eye surface. In addition to the treatments mentioned for stage 2, you may need a night time ointment, prescription eye drops, and you are very likely a candidate for the LipiFlow.

Stage 2

In Stage 2 Meibomian Gland Dysfunction, you may experience some mild symptoms, including itching, possible redness, burning, even watery eyes. The doctor may note worsening oil secretions and minimal staining on the eye surface during the exam. At this point, you already have some gland loss due to blockages in the glands. Gland loss is irreversible but at-home treatments can help to unblock the remaining glands to prevent further loss. At this stage, at-home treatment includes the hot compress, lid hygiene, and omega-3s from stage 1, as well as the addition of artificial tears to help ease the symptoms you may be experiencing. You may also be a candidate for in-office procedures, such as the LipiFlow treatment.



Stage 4

The fourth and final stage of MGD is the most severe. You see significant gland loss, with notable symptoms and possible damage to the eye surface. It is very important at this stage to unblock the remaining glands to allow them to produce what oils they can. At home treatments are good for maintenance at this stage, but in office procedures will be your best course of action. This can be LipiFlow, PROKERA membranes to heal the eye surface, or punctal plugs to block the tear ducts and prevent the tears from draining too quickly. Your doctor will be able to determine the best course of action.

