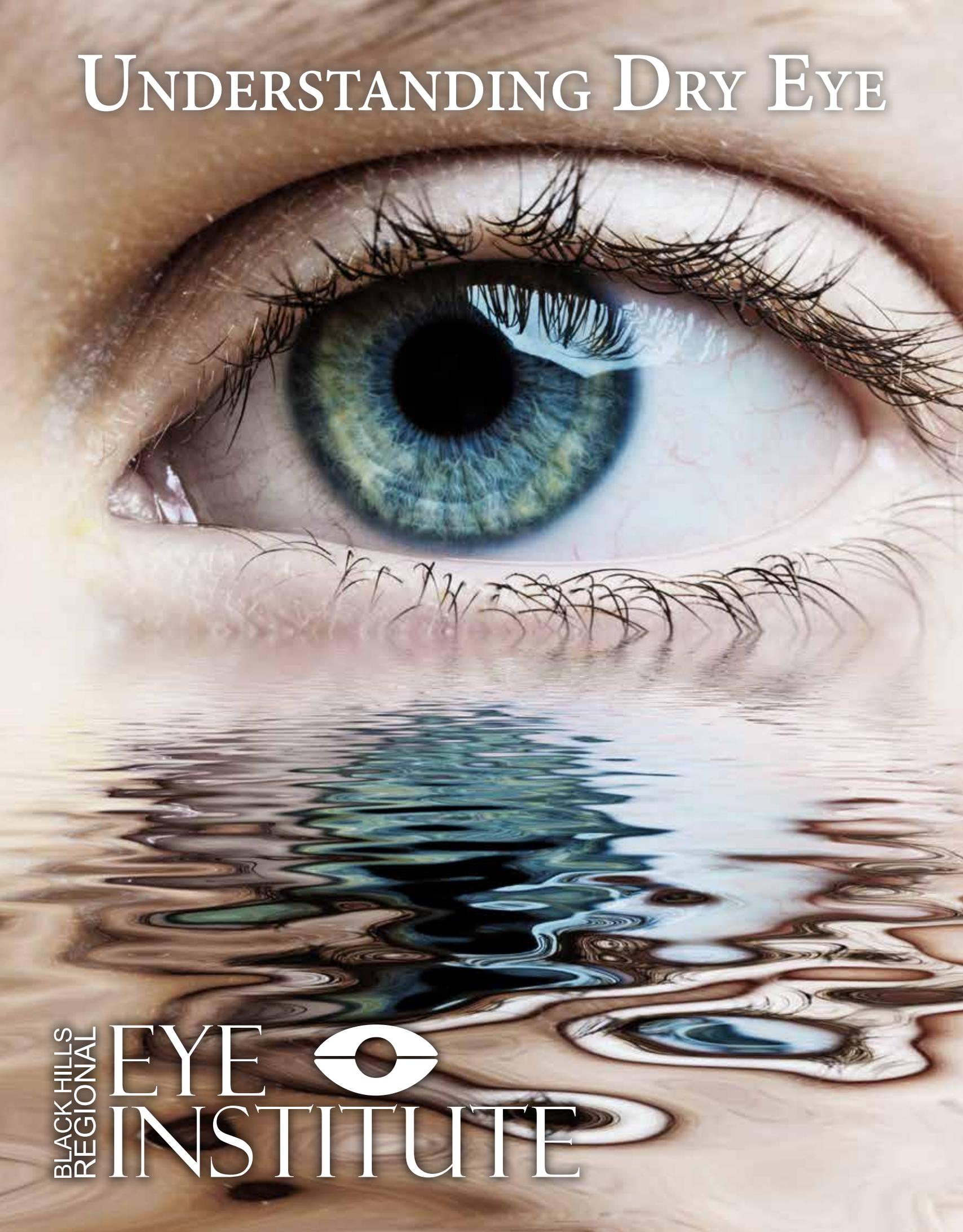


# UNDERSTANDING DRY EYE



BLACK HILLS  
REGIONAL

EYE   
INSTITUTE

# Pre-Testing Instructions

Phone 605-718-3937

NAME \_\_\_\_\_

Your appointment is scheduled:

\_\_\_\_\_ at \_\_\_\_\_

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## Reminders for best test results:

- Please DO NOT use any eye drops in your eyes for at least four hours prior to your arrival.
- Please do not wear any eye makeup to your appointment.
- If you wear contact lenses, make sure not to wear them for at least four hours prior to your testing.
- Please do not use ointments or gels in your eyes the evening prior to your appointment.
- Please do not rub or touch your eyes prior to testing.
- Do not apply eye creams, facial creams, mascara or sunscreen prior to testing.
- This appointment does not typically require your eyes to be dilated.

Plan to be at the Eye Institute for a minimum of one hour the day of your appointment



Black Hills Regional Eye Institute & Laser Vision Center  
#bhrei #visionforlife @blackhillseyes

# WHAT IS DRY EYE?

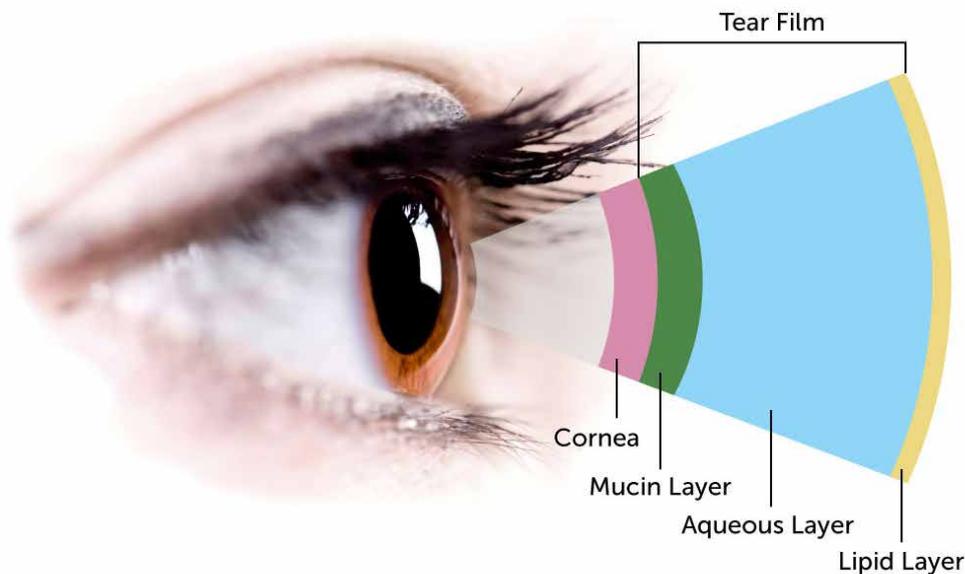
Dry eye is a complex, multifactorial disease process that affects the eye's ability to produce healthy lubrication for the ocular surface.

Tears are necessary for maintaining the health of the front surface of the eye and for providing clear vision. Dry eye is a common and often chronic problem, particularly in older adults.

**People with dry eyes either do not produce enough tears or their tears are of a poor quality.**

**Inadequate amount of tears.** Tears are produced by several glands in and around the eyelids. Tear production tends to diminish with age or as a side effect of certain medicines. Environmental conditions, such as wind and dry climates, can also decrease tear volume due to increased evaporation. When the normal amount of tear production decreases or tears evaporate too quickly from the eyes, symptoms of dry eye can develop.

**Poor quality of tears.** Tears are made up of three layers: oil, water and mucus. Each component protects and nourishes the front surface of the eye. A smooth oil layer helps prevent evaporation of the water layer, while the mucin layer spreads the tears evenly over the surface of the eye. If the tears evaporate too quickly or do not spread evenly over the cornea due to deficiencies with any of the three tear layers, dry eye symptoms can develop.



**Lipid (oil) layer:**  
lubricates and prevents evaporation

**Aqueous (water) layer:**  
nourishes and protects the cornea

**Mucin layer:**  
adheres tears to the eye

**Meibomian glands:**  
create the lipid (oil) layer of the tear film, a blockage can lead to evaporative dry eye

# WHAT ARE THE SYMPTOMS OF DRY EYE?

Dry eye is something that is not “cured” with artificial tears. Artificial tears are generally a component of treatment, however they do not impact the underlying cause of dryness.

## How are your eyes feeling?



a bit itchy



teary and watery



kinda gritty



sooooo dry



burning



getting blurry  
vision at times



red & irritated



they're  
stinging



bothered by  
my contacts



feel like something's  
in there

# WHAT CAUSES DRY EYE?

Dry eyes can develop for many reasons, including:

 **AGE** - Dry eyes are a part of the natural aging process. The majority of people over age 65 experience some symptoms of dry eyes.

 **MEDICATIONS** - Certain medicines, including antihistamines, decongestants, blood pressure medications and antidepressants, can reduce tear production.

 **ENVIRONMENTAL CONDITIONS** - Exposure to smoke, wind and dry climates can increase tear evaporation resulting in dry eye symptoms. Failure to blink regularly, such as when staring at a computer screen for long periods of time, can also contribute to drying of the eyes.

 **GENDER** - Women are more likely to develop dry eyes due to hormonal changes caused by pregnancy, the use of oral contraceptives and menopause.

 **MEDICAL CONDITIONS** - People with rheumatoid arthritis, diabetes and thyroid problems are more likely to have symptoms of dry eyes. Also, problems with inflammation of the eyelids (blepharitis), inflammation of the surfaces of the eye, or the inward or outward turning of eyelids can cause dry eyes to develop.

 **OTHER FACTORS** - Long-term use of contact lenses can be a factor in the development of dry eyes. Certain eye surgeries can contribute to dryness.

# MEDICAL CONDITIONS BLEPHARITIS OR MGD?

Blepharitis is a chronic inflammation of the eyelid typically caused by an overgrowth of the normal bacteria living along the base of the lid and lashes. These bacteria secrete toxins that cause irritation, redness and inflammation of the lid structures.

One of the end-results of this chronic inflammation is a decrease in production of oil. Oil is an essential ingredient in our tears and is produced by glands in the lid called meibomian glands. This decrease in oil production is referred to as Meibomian Gland Dysfunction (MGD). MGD is thought to be the leading cause of dry eye throughout the world. In MGD, the oil glands become obstructed. If untreated, this obstruction gradually causes the meibomian glands to atrophy, resulting in worsening dry eye and more inflammation in the eye.

Treating MGD aggressively before severe atrophy is both beneficial in terms of improving symptoms, but also protective against future gland atrophy and thus preventative in nature.



## Normal Eyelid (meibomian) Glands:

Meibomian glands produce the oils needed for a healthy tear film



## Gland (oil) Dropout:

MGD occurs when the meibomian glands become blocked. If this blockage is left untreated the glands will drop out entirely.

## What are the risks if left untreated?

- If untreated, dry eye can be more than just irritating or uncomfortable.
- Severe dry eye can damage the eye's surface tissue and possibly scar the cornea.
- Contact lens wear may be more difficult due to the possibility of increased irritation and greater chance of an eye infection.



# TREATMENT OPTIONS

## LIPIFLOW THERMAL PULSATION SYSTEM

Is a significant technological shift managing evaporative dry eye. Applying a combination of directed heat and pulsatile pressure, many find a single treatment effective in relieving the blockage of their Meibomian glands.

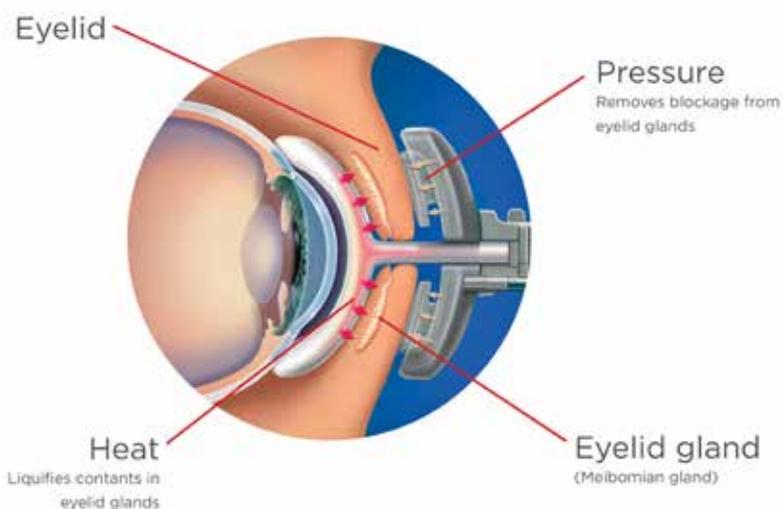
LipFlow treatment is clinically proven with sustained results. In a clinical study about 79% of patients reported an improvement in overall dry eye symptoms after a single LipiFlow treatment. Depending on the severity of your specific condition and your response to treatment, you may need to repeat the LipiFlow treatment periodically as your symptoms return over time.

*\*This treatment is not covered by insurance and is considered an out of pocket expense.*

### Benefits of LipiFlow

- Improves eye function and comfort
- Safe and approved (FDA)
- Reduces the need for eye drops
- Treats the root cause of MGD
- Quick, outpatient procedure (typically 15 minutes)

**LIPIFLOW**<sup>®</sup>  
THERMAL PULSATION



# TREATMENT PREPARATION

## **LipiFlow Pre-treatment Instructions:**

- No eye make-up the day of your procedure.
- Punctal plugs may be removed during the LipiFlow procedure, if this occurs they can be re-inserted.
- Cosmetic lashes may become loose or fall off due to heating effect of the procedure.
- LipiFlow may be safely combined with BlephEx, IPL, Maskin Probing or other dry eye procedures on the same day.

## **What to Expect During Treatment:**

- Expect to be at the Eye Institute for at least an hour on the day of your LipiFlow procedure.
- 1-2 drops of topical numbing drops will be placed in both eyes.
- The LipiFlow activator will be gently placed in both eyes and your lids will be taped shut around the activators.
- The LipiFlow device will then warm your eyelids. Your eye will not be warmed and is protected by the LipiFlow activator. You will feel heat and pressure applied to your lids, the entire procedure takes less than 15 minutes. Most patients describe the procedure as pleasant and comfortable.
- Once completed, the activators will be removed from lids and you can return to normal activities.

## **Post Treatment and Recovery:**

- Some patients do report immediate improvement in symptoms following LipiFlow, however it is more common for symptom relief to occur gradually over 2-3 months.
- Ongoing care will help to maximize your improvement and you will be given specific instructions tailored to you and your eyes.
- Most patients report an improvement in their symptoms by 50%, however some patients report more significant symptom relief.
- The effect of LipiFlow does “wear-off” following the procedure slowly over time. Patients can expect to repeat LipiFlow in 1-3 years. Compliance in on-going care can help extend the effectiveness of LipiFlow.
- Approximately 10 – 20% of patients won’t notice desired symptom relief.

# INTENSE PULSED LIGHT (IPL)

Intense pulsed light therapy is a common dermatology treatment, which can be used to treat issues such as rosacea, sun damage, and acne scarring. As a treatment for dry eye, it is a groundbreaking approach. With IPL technology, light pulses penetrate the tissue and create heat, targeting the abnormal vessels that are the root cause of the inflammation associated with dry eye. The body's natural reaction to the treatment removes the abnormal vessels and heals the inflammation threatening the skin and eyelid. IPL technology treats your skin and eyelid inflammation.

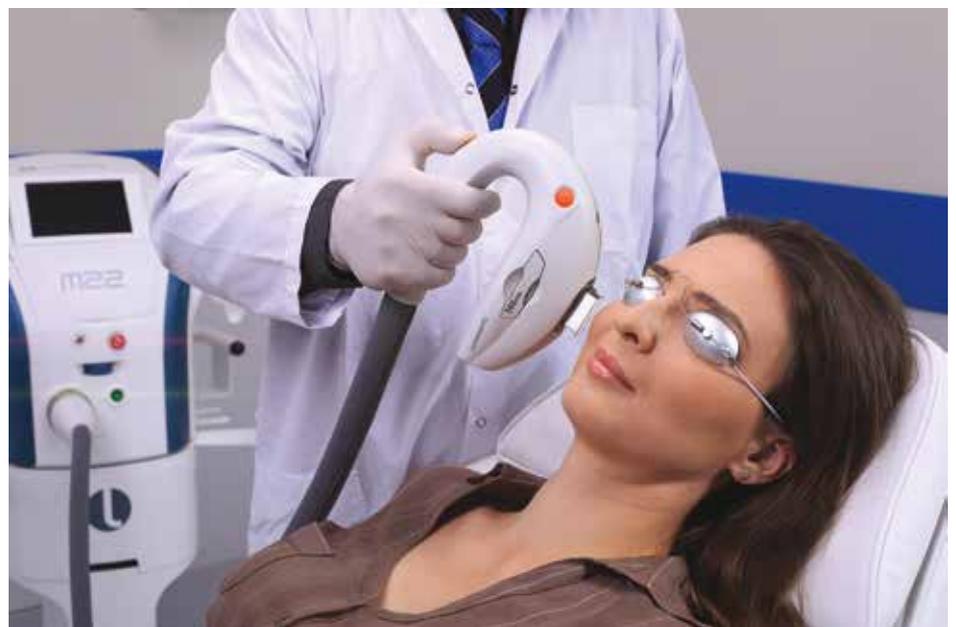
## Benefits of IPL

*\*This treatment is not covered by insurance and is considered an out of pocket expense.*

- Improves eye function and comfort
- Safe and approved (FDA)
- Reduces the need for eye drops
- Treats the root cause of MGD
- Quick, outpatient procedure (typically 15 minutes)



*IPL treatment for skin and eyelid inflammation includes gentle pulses from ear to ear*



# TREATMENT PREPARATION

## **IPL Pre-treatment Instructions:**

- Avoid excessive sun exposure in the weeks leading up to IPL
- Avoid tanning, tanning beds and tanning lotions prior to IPL, if you are “tanned” for IPL we will have to reschedule your treatments
- Do not wear any make-up or lotion on the day of IPL treatment
- Do not use Retin-A or tretinoin for 1 week prior to or following IPL
- Do not take AcuTane (isotretinoin) 1 month prior to IPL
- Avoid photosensitizing medications and supplements 1 week prior to IPL (St. John’s wort, doxycycline, tetracycline) and 1 week after IPL

## **What to Expect During the Treatment**

- Expect to spend at least an hour at BHREI for each IPL session.
- If you have a history of cold sores, take your prescribed medications (Valtrex, Famvir, Zovirax) one day prior to, the day of, and one day after IPL.
- Expect a “rubber-band” snap like sensation with each IPL application. IPL is typically well-tolerated with minimal pain, however the sensation varies from person to person.
- Expect mild redness and swelling for 24-48 hours following IPL. Ice packs can be applied to reduce swelling and Aquaphor can be applied to the skin if irritated
- Call the office immediately if any blisters or bruising develops, this is rare and will heal.

## **Post Treatment and recovery**

- Patients can resume normal activities 24 hours after IPL
- Patients can apply make-up 24 hours after IPL
- Apply sunscreen (30 – 50 SPF) following IPL for 2 weeks
- Sunspots and age spots will darken while healing, they should return to normal with healing and time
- Most patients require 3-4 treatments to achieve satisfactory results, most patients will need maintenance IPL treatment once every 6-12 months
- IPL may be combined with other dry eye procedures such as punctal occlusion, BlephEx, LipiFlow and medications.

# MASKIN PROBING

Maskin Probing is a procedure designed to clear obstructions in the meibomian glands, including the periductal fibrosis found in 75% of diseased glands. It is an effective treatment for meibomian gland dysfunction (MGD). The procedure is considered non-invasive, and is performed in the office with topical anesthetic. At least one study has shown that atrophied glands can regenerate after probing.

Many patients only need to be probed once, whereas others require repeat probing. Repeat probing is usually not required for a minimum of 7 months, and usually quite a bit more.



## Meibomian Gland Probing Procedure

Probing involves:

- 1) Examination
- 2) Anesthetic
- 3) Initial probing to completely open the glands
- 4) Piercing through fibrotic tissue

All glands of all lids may be probed initially and during follow-up procedures. Occasionally only some glands may be probed. After initial probing if several glands remain blocked, indicated by symptoms of persistent pain or foreign body sensation in the area of the blocked glands, only these glands may need to be re-probed. If anesthetic cannot be tolerated, probing can be performed safely without anesthetic, although there will be copious tearing.

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# BLEPHEX



## Eyelid Cleaning Procedure to help Maintain Clean and Healthy Lids

- Over 50% of all patients suffer from some type of dry eye and blepharitis symptoms.
- BlephEx® is a new, in-office procedure that allows your doctor to take an active roll in helping prevent, as part of a healthy lifestyle, the risk of dry eye and blepharitis.
- BlephEx® cleans eyelids to maintain eyelid hygiene.
- With regular treatments, as part of a healthy lifestyle, patients may be able to reduce their risk of returning symptoms associated with dry eye and blepharitis.
- The BlephEx® treatment only takes a few minutes to perform.

Healthy Lids for Life!

A decorative graphic at the bottom of the page showing a splash of blue water with white bubbles, creating a dynamic and fresh appearance.

# TREATMENT OPTIONS

## Therapy

○ **Night Time Ointment** – apply ¼ strip inside the lower eyelid before bed.

- » Refresh PM
- » Retaine PM
- » Other: \_\_\_\_\_

○ **Blinking Instructions**

○ **Lid Hygiene** – clean the eyelids twice daily

- » OcuSoft HypoChlor – spray round cotton pad twice and clean eyelids as directed

- » Cliradex – follow labeled instructions, may sting if getting Cliradex in the eye
- » Other: \_\_\_\_\_

○ **Lid Heat + Massage** – twice daily lid therapy

- » Place Bruder mask in microwave for 20 to 30 seconds. Place mask on closed eyes for 5 – 10 minutes. Immediately following heat, massage eyelids as directed.

○ **Punctal Plugs** – Closure of the tear drainage system to preserve your tears and reduce dry eye symptoms, closure can be permanent or temporary

## Drops/Medication

○ **Artificial Tears** – 1 drop 4 times per day or as directed

- » Refresh Advanced
- » Retaine MGD
- » Systane Balance
- » Other: \_\_\_\_\_

○ **Steroid Eye Drops** – 1 drop 4 times per day for 2 weeks, taper to 2 times per day for 2 weeks, shake prior to use and taper as directed

- » Pred Forte or Prednisolone Acetate
- » Lotemax
- » Fluorometholone

○ **Restasis** – 1 drop 2 times per day or as directed

- » Use for a minimum of 90 days, continue until directed to stop

- » May sting upon instillation

○ **Xiidra** – 1 drop 2 times per day or as directed

- » Use for a minimum of 90 days, continue until directed to stop
- » May sting upon instillation, can cause mild alteration of taste

○ **HydroEye** – take 2 softgels twice daily by mouth

- » High-intensity, therapeutic nutritional support for dry eye
- » Recommended dose of Omega 3 is 1,000 mg twice daily

○ **Doxycycline** – 50 mg twice daily by mouth for one month, then once daily for two months.

- » Taking with milk may reduce the absorption of the medication
- » May increase sun sensitivity
- » Taking a probiotic may reduce side effects

## Treatment

○ **LipiFlow Thermal Pulsation** – 12 minute treatment to therapeutically heat the inner eyelid surface with simultaneous pressure to unplug the oil glands of the lid

○ **Intense Pulsed Light (IPL)** – With IPL technology, light pulses penetrate the tissue and create heat, targeting the abnormal vessels that are the root cause of the inflammation associated with dry eye.

○ **Maskin Probing** – Is a procedure designed to clear obstructions in the meibomian glands

○ **BlephEx Lid Exfoliation** – In-office procedure to precisely and carefully clean the eyelids, may be combined with LipiFlow

○ **Amniotic Membrane Treatment** – A bandage amniotic membrane can be used to provide advanced healing to those suffering from recurrent corneal erosions or other corneal diseases

○ **Other:** \_\_\_\_\_

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BLACK HILLS REGIONAL EYE INSTITUTE

2800 Third Street | Rapid City, SD 57701 • 605.718.3937 | [www.lasikrapidcity.com](http://www.lasikrapidcity.com)

We want you to experience life without the limitations of dry eye. That is why we have focused our resources to provide the Dry Eye Center at the Black Hills Regional Eye Institute. New diagnostic and treatment technologies, along with new and traditional medications and nutraceuticals, can offer relief from what can be a debilitating disease process. Restoring optimal ocular surface health can allow for improved comfort with contact lenses, improved surgical results, and most importantly improved quality of life!