

Can Insulin Resistance Affect Your Eyes?

When the problem is not in the eyes — but in blood sugar

HOOK

Your eyes may be showing you something... your body has not told you yet.

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Όταν το πρόβλημα δεν είναι
στα μάτια — αλλά στο σάκχαρο

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Διαταραχή στον
μεταβολισμό

**ΦΛΕΓΜΟΝΗ &
ΑΓΓΕΙΑΚΕΣ ΑΛΛΟΙΩΣΕΙΣ**
Επηρεάζουν όλο το σώμα,
συμπεριλαμβανομένων των ματιών

ΕΠΙΠΤΩΣΗ ΣΤΑ ΜΑΤΙΑ
Ξηρότητα, θολή όραση,
ευαισθησία, ασταθές
δάκρυο, φλεγμονή

115
mg/dL

ΑΝΤΙΜΕΤΩΠΙΣΕ ΤΗ ΡΙΖΑ.
ΑΠΟΚΑΤΑΣΤΗΣ ΤΗΝ ΙΣΟΡΡΟΠΙΑ.
ΠΡΟΣΤΑΤΕΨΕ ΤΗΝ ΟΡΑΣΗ ΣΟΥ.

Introduction

If you have insulin resistance or prediabetes and notice:

- blurred vision that comes and goes
- eyes that get tired easily
- burning or dryness
- watery eyes without an obvious reason
- difficulty with screens

you probably think:

“It’s just fatigue...”

But the reality may be different:

the problem may start from blood sugar — not from the eyes

Blurred vision is a recognized symptom of diabetes and glucose fluctuations, while metabolic dysfunction is also associated with dry eye, affecting tear production, eyelid glands and inflammation of the ocular surface.

What Is Insulin Resistance?

History & Evolution

WHAT IS INSULIN RESISTANCE?
The hidden metabolic dysfunction that affects your whole body — and can impact your eyes.

DEFINITION
Insulin resistance is a metabolic condition in which the body's cells do not respond properly to insulin. The pancreas produces more insulin to overcome this resistance, leading to higher blood sugar levels and increased risk of prediabetes, type 2 diabetes, and other chronic diseases.

HOW INSULIN WORKS (VS. INSULIN RESISTANCE)

NORMAL (INSULIN SENSITIVE)
Pancreas releases insulin → Insulin acts like a key that opens the cell → Glucose enters the cell and is used for energy → Blood sugar stays normal

INSULIN RESISTANCE
Pancreas produces more insulin → Cells don't respond well to insulin → Less glucose enters the cell and builds up in the blood → Blood sugar rises over time

WHAT CAUSES INSULIN RESISTANCE?
Poor diet (High in refined carbs, sugar and unhealthy fats)
Sedentary lifestyle (Lack of physical activity)
Excess body weight (Especially abdominal fat)
Poor sleep and chronic stress
Genetics (Family history)
Chronic inflammation (Low-grade inflammation in the body)

WHAT HAPPENS OVER TIME?
Insulin resistance develops → Pancreas makes more insulin → Blood sugar starts to rise → Prediabetes → Type 2 Diabetes

This process can be silent for years. Many people have no symptoms until complications or early signs appear — including in the eyes.

COMMONLY AFFECTED SYSTEMS

- HEART & BLOOD VESSELS**: Increases risk of hypertension, heart disease, stroke
- LIVER**: Fatty liver, inflammation
- HORMONES**: PCOS, menstrual irregularities, low testosterone
- BRAIN**: Brain fog, mood changes, higher risk of dementia
- EYES**: Dry eye, blurred vision, retinopathy risk

KEY FACTS

- Not just about sugar. It's a systemic metabolic dysfunction.
- Strongly linked to inflammation, oxidative stress and poor circulation.
- The earlier you address it, the better your long-term outcomes.

HOW COMMON IS IT?
Estimates suggest up to **50%** of adults may have insulin resistance or prediabetes. Many don't even know it.

EARLY SIGNS (MAY BE SUBTLE)

- Blurred vision that comes and goes
- Eye fatigue, especially with screens
- Dry, burning or irritated eyes
- Watery eyes without a clear reason
- Vision changes during the day

WHAT YOU CAN DO

- Eat real, whole foods (Stabilize blood sugar)
- Move your body daily (Increase sensitivity)
- Sleep well & manage stress (Support your hormones)
- Support your eyes (With daily eyelid and tear film care)

Support your metabolism. Protect your eyes. Improve your quality of life.

BOTTOM LINE: Insulin resistance is the root cause behind many modern health problems — including the ones affecting your eyes. Treat the system, not just the symptoms.

Want a personalized protocol? Contact us at info@ophthalmogen.com

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Insulin resistance is a metabolic condition in which:

the cells do not respond properly to insulin.

The NIDDK defines insulin resistance as a condition in which the body “does not respond to insulin the way it should,” which can lead to elevated glucose levels and prediabetes.

Historical Background

- **1921:** Insulin was discovered by Banting & Best

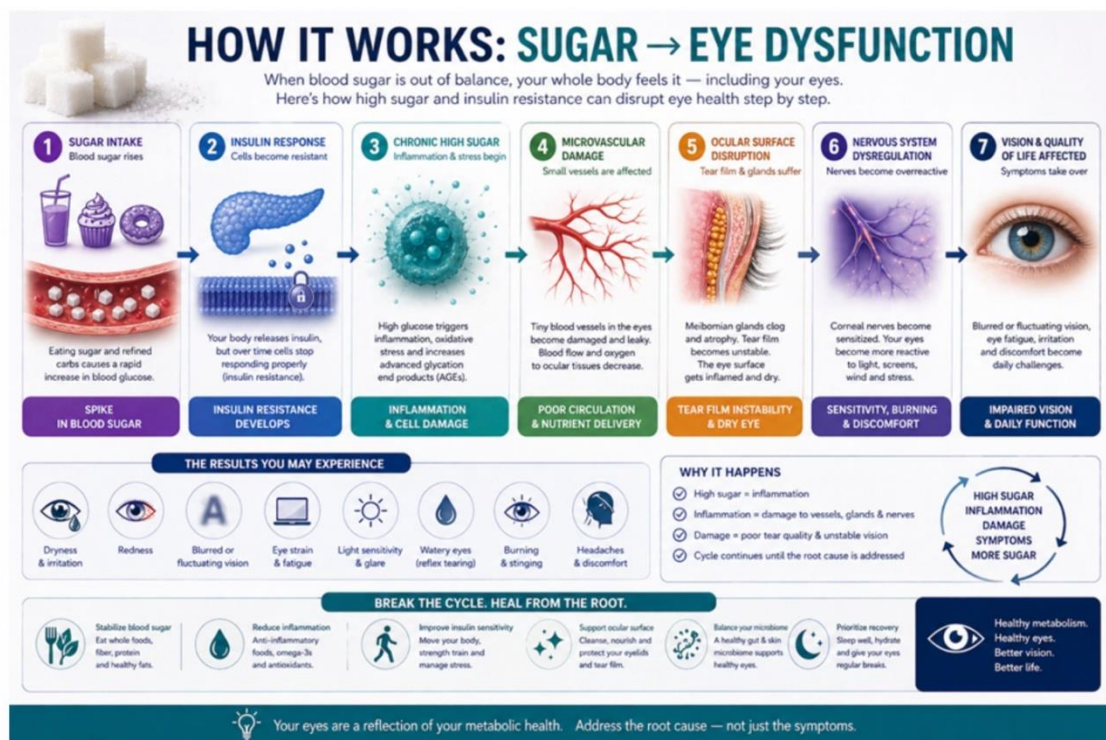
- **1930–1950:** The role of insulin in blood sugar regulation became better understood
- **1960–1980:** Insulin resistance was recognized as a distinct metabolic condition
- **2000+:** It became linked to metabolic syndrome, low-grade inflammation and chronic disease

What We Know Today

it is not only about blood sugar
it is **systemic metabolic dysfunction**

Insulin resistance and prediabetes are associated with elevated glucose levels, weight gain and future risk of type 2 diabetes.

How Common Is It?



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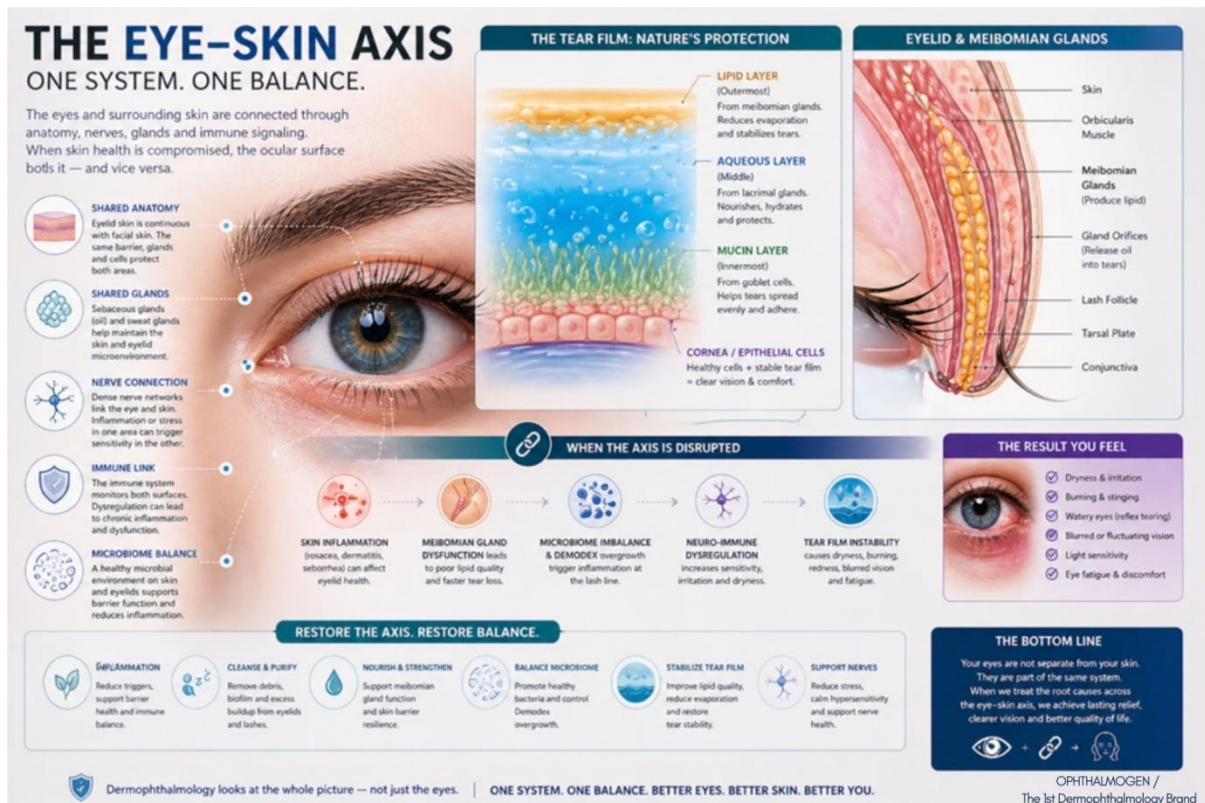
There is no single percentage that applies to every population, but prediabetic and metabolic dysfunction are extremely common, and many people remain undiagnosed or experience mild symptoms for a long time. NIDDK and MedlinePlus note that type 2 diabetes can develop slowly and many people may not have clear symptoms early on.

And very often:

the first signs do not appear only in blood tests but in daily body function

Including the eyes.

The Connection: Blood Sugar → Eyelids → Tear Film → Vision



Vision is not just an “eye” issue.

It is a functional system:

- eyelids
- Meibomian glands
- tear film
- ocular surface
- neurosensory regulation

This is the:

Eye-Skin Axis

When insulin resistance is present:

the entire system becomes dysregulated.

Glucose is not the only thing that changes. Also affected are:

- tear quality
- eyelid gland function
- microcirculation
- inflammatory status
- visual stability

High blood sugar can affect both the tear-producing glands and the eyelid glands that help prevent rapid tear evaporation, contributing to dry eye.

How Insulin Resistance Affects the Eyes

Blood Sugar Fluctuations → Direct Impact on Vision

HOW INSULIN RESISTANCE AFFECTS THE EYES
Insulin resistance doesn't just affect blood sugar. It disrupts the entire eye system.

THE BIG PICTURE
Insulin resistance causes metabolic and inflammatory changes that disrupt the delicate balance of the ocular surface, eyelid glands, tear film and microcirculation, leading to dry eye, discomfort and unstable vision.

5 MAIN WAYS INSULIN RESISTANCE AFFECTS THE EYES

- 1 BLOOD SUGAR FLUCTUATIONS**
 - Changes in glucose levels affect fluid balance and lens shape.
 - Leads to fluctuating focus and blurry vision that comes and goes.
- 2 MICROVASCULAR DYSFUNCTION**
 - Insulin resistance impairs small blood vessels.
 - Reduced blood flow means less oxygen and nutrients to the eye tissues.
 - Causes eye fatigue and long-term damage.
- 3 CHRONIC INFLAMMATION**
 - Low-grade inflammation increases inflammatory mediators.
 - Damages the ocular surface and increases irritation and redness.
- 4 MEIBOMIAN GLAND DYSFUNCTION**
 - Gland secretions become thicker and more stagnant.
 - Glands become blocked or underactive.
 - Leads to evaporative dry eye.
- 5 TEAR FILM INSTABILITY**
 - Poor tear quality and imbalance of all layers.
 - Light scatters, vision becomes unstable and uncomfortable.

WHAT HAPPENS

- Eye system becomes imbalanced
- Dry eye, irritation, and discomfort
- Fluctuating, blurry or unstable vision
- Reduced quality of life

COMMON SYMPTOMS

- Blurry vision that changes during the day
- Worse with screens
- Eye fatigue and heaviness
- Dryness, burning, stinging
- Watery eyes (reflex tearing)
- Blepharitis and chalazia

WHO IS AT RISK?

- Overweight or obesity
- Sedentary lifestyle
- High sugar & refined carbs
- Family history
- Prediabetes or type 2 diabetes

KEY MESSAGE Insulin resistance affects the entire eye system — not just your blood sugar.

Treating the root causes and supporting the eye system is essential for comfort, stability and long-term eye health.

Restore the system. Improve your eyes. Improve your life.

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When blood sugar rises or falls:

- fluid osmolarity changes
- the lens may be temporarily affected
- focusing can fluctuate
- the tear film becomes less stable

Result:

blurred vision that changes throughout the day

When diabetes treatment plans or medications change, blurred vision may occur for days or weeks because glucose changes can alter eye fluids or cause swelling in tissues involved in focusing.

Microvascular Dysfunction

Metabolic dysregulation also affects microcirculation.

small vessels are affected blood flow may decrease tissue nutrition may be reduced

Result:

eyes that feel tired for no obvious reason

Chronic Inflammation

Insulin resistance is associated with low-grade inflammation.

inflammatory mediators increase the ocular surface becomes stressed irritation increases

Result:

dry eye and burning

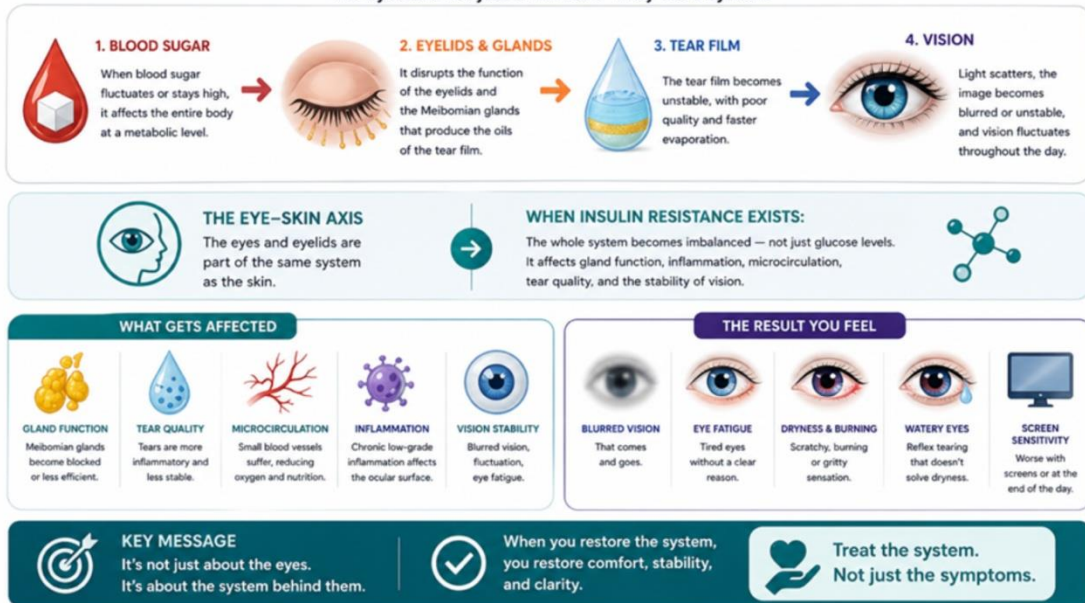
Inflammation is one of the mechanisms linking diabetes and dry eye.

Meibomian Gland Dysfunction

THE CONNECTION

Sugar → Eyelids → Tear Film → Vision

"The eyes are not just a window. They are a system."



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The Meibomian glands regulate the lipid layer of the tears.

When their function is disrupted:

- oils become thicker
- flow decreases
- obstruction increases

Result:

evaporative dry eye

The eyelid glands that help prevent tear evaporation can be affected in diabetes.

Tear Film Instability

The tear film is the first optical surface of the eye.

When it becomes unstable:

- light scatters
- the image becomes distorted
- vision becomes unstable

Result:

blurred vision “foggy vision” that comes and goes poor visual quality

The Classic Pattern

DO YOU FEEL THIS?
Your eyes may be trying to tell you something.

These are common signs of eye dysfunction linked to systemic & metabolic imbalance.

RECOGNIZE THE SIGNS

DRYNESS & IRRITATION Eyes feel dry, scratchy or gritty. You may need to use eye drops often.	BURNING & STINGING A burning or stinging sensation, especially toward the end of the day or in the morning.	BLURRED OR FLUCTUATING VISION Vision that comes and goes. Clear one moment, blurry the next.	EYE STRAIN & FATIGUE Tired eyes, heaviness, or discomfort after screen time or reading.	LIGHT SENSITIVITY & GLARE Bright lights, headlights or screens feel too bright or uncomfortable.	WATERY EYES (REFLEX TEARING) Watery eyes even though they feel dry. Your eyes are trying to compensate.
REDNESS Persistent redness that doesn't go away.	HEAVINESS & TIRED FEELING Eyes feel heavy, tired or difficult to keep open.	POOR FOCUS & CONCENTRATION Harder to focus, especially when reading or doing close work.	SENSITIVITY TO WIND & AIR Wind, air, conditioning or fans make your eyes feel irritated.	ITCHY LIDS & CRUSTING Itchy eyelids, flaky skin or crusting along the lash line.	END OF DAY DISCOMFORT Your eyes feel worse as the day goes on.

WHY IT HAPPENS
These symptoms are not just “eye problems”. They are signals of deeper imbalances: inflammation, insulin resistance, hormonal shifts, poor microcirculation, nervous system dysregulation and disrupted tear film.

YOU'RE NOT ALONE
Millions of people experience these symptoms every day without understanding the real cause — or the solution.

YOUR EYES. YOUR HEALTH. CONNECT THE DOTS.

- Find the root cause
- Restore balance in your body
- Support your eye system
- See clearly. Live fully.

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If you notice that your vision:

- clears after blinking
- gets worse with screens
- changes throughout the day
- feels worse toward the end of the day

then the problem is often a **tear film issue** not necessarily a glasses issue

The Paradox: Watery Eyes While Having Dry Eye

THE PARADOX
Tearing Eyes That Are Still Dry

Why your eyes can water... even when they are not getting enough real moisture.

! Watery eyes do not always mean healthy eyes. It can be a sign of dry eye.

WHAT YOU SEE
Tearing, watery eyes

- Tears running down your face
- Watery, shiny eyes
- Feeling of irritation or burning
- Blurred or fluctuating vision

WHAT'S REALLY HAPPENING
Your eyes are actually dry

- Tear film is unstable
- Eyes become dry and irritated
- Reflex tearing is triggered
- Tears are watery, not protective

THE MECHANISM: WHY DRY EYES CAUSE TEARING

- 1. Tear film becomes unstable and breaks up**
The protective layer is thin and of poor quality.
- 2. Nerves detect dryness as a threat**
The eye surface sends stress signals.
- 3. Reflex response is activated**
The brain triggers the lacrimal glands to produce more tears.
- 4. Excess watery tears are produced**
These tears lack mucin, lipids and stability.
- 5. Tears evaporate quickly and don't stay**
The cycle repeats: dry → tear → evaporate → dry

THE RESULT
Watery, irritated, tired eyes that never feel truly comfortable.

WHAT THIS MEANS

- ✓ Tearing does not equal hydration. Watery tears cannot compensate for poor tear quality.
- ✓ The problem is not too many tears. The problem is poor quality and instability.
- ✓ Treating only the surface is not enough. You must address the root cause: tear film instability and eyelid/gland dysfunction.

WHAT REALLY HELPS

- Restore the glands**
Heat therapy to open and support Meibomian gland function.
- Clean the eyelids**
Remove biofilm, reduce inflammation, improve the eyelid environment.
- Stabilize the tear film**
Support all layers: lipids, aqueous, mucin for long-lasting stability.
- Reduce eye rubbing**
Rubbing worsens inflammation, breaks the tear film and keeps the cycle alive.

REMEMBER
Watery eyes can be a cry for help, not a sign of health. Fix the system. Break the cycle. Find real comfort.

THE BOTTOM LINE
When the tear film is unstable, your eyes react. When the system is restored, your eyes heal.

It's not about stopping the tears. It's about restoring the balance.

OPHTHALMOGEN
Restoring the system. Restoring comfort.

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Many people wonder:

“If my eyes are watering, how can I have dry eye?”

The answer is:

- dryness triggers reflex tearing
- those tears are often low-quality
- they do not stabilize properly on the eye surface

Result:

the eyes water but remain dry

Excessive tearing can be a compensatory response to chronic dryness.

Microbiome & Demodex

Healthy balance = Healthy eyelids = Healthy eyes

1. THE EYELID ECOSYSTEM
Your eyelids are home to a delicate microbiome — good and bad microorganisms that live in balance.
Balanced microbiome = protection & stability
Imbalance (dysbiosis) = inflammation & dysfunction

2. WHAT IS DEMODEX?
Demodex is a microscopic mite that lives in hair follicles and sebaceous (Meibomian) glands.
Demodex folliculorum lives in hair follicles
Demodex brevis lives in Meibomian glands
They are normal residents in small numbers, but overgrowth causes problems.

3. WHEN THE BALANCE BREAKS
Several factors can disrupt the eyelid ecosystem and lead to Demodex overgrowth & microbial imbalance.
HORMONAL & METABOLIC CHANGES (Insulin resistance, diabetes)
CHRONIC INFLAMMATION (Low-grade, persistent)
HIGH SCREEN EXPOSURE (Decreases blink rate & tear stability)
POOR LID HYGIENE & COSMETICS (Buildup, biofilm, residue)
STRESS, POOR SLEEP & DIET (Weakens immune defenses)
Result: Dysbiosis • Demodex proliferation • Inflammation • Gland dysfunction
Tear film instability • Dry eye symptoms

4. HOW DEMODEX & DYSBIOSIS AFFECT YOUR EYES
1. OVERGROWTH: Too many Demodex & harmful bacteria
2. INFLAMMATION: They trigger the immune system and release inflammatory mediators
3. GLAND DYSFUNCTION: Meibomian glands become blocked, oils thicken or decrease
4. TEAR FILM INSTABILITY: Poor oil quality + inflammation = tear film breaks up faster
5. SYMPTOMS: Dryness, burning, redness; Itching, irritation; Blurred or fluctuating vision; Styes & chalazia

5. SIGNS YOU MAY HAVE A PROBLEM
Red, irritated eyelid margins
Cylindrical dandruff (collarettes) at the base of lashes
Itching or burning
Frequent styes or chalazia
Dry eye that doesn't improve with drops alone

6. WHY IT MATTERS
Demodex & dysbiosis are a root cause, not just a symptom.
If you only treat the surface, the problem comes back.
Restoring the ecosystem is the key to long-term relief and stability.

7. THE SOLUTION: RESTORE THE ECOSYSTEM
CLEANSE THE LASH LINE: Removes biofilm & debris; Reduces Demodex load; Restores healthy microenvironment.
SUPPORT & STABILIZE THE ENVIRONMENT: Soothes irritation & inflammation; Hydrates the eyelid microenvironment; Supports daily balance & comfort.
HEAT THERAPY ACTIVATE THE GLANDS: Melts thick oils; Improves gland flow; Supports tear film stability.
Consistency = Balance | Balance = Comfort | Comfort = Clearer, Healthier Vision

8. KEY TAKEAWAYS
Your eyelids have an ecosystem that must stay in balance.
Demodex overgrowth and dysbiosis lead to inflammation, gland dysfunction and dry eye.
Insulin resistance and metabolic inflammation increase your risk.
A system-based approach is the only way to break the cycle and restore eye health.
Healthy eyelids. Stable tears. Clearer vision. Treat the system. Not just the symptoms.

HEALTHY ECOSYSTEM = HEALTHY EYES | CLEANSE daily + SUPPORT daily + HEAT regularly = BALANCE long-term

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Metabolic dysregulation can affect:

- the skin
- the eyelids
- the microbiome
- the lash line

Result:

blepharitis
chronic irritation
chalazia
increased Demodex-related burden

Why the Problem Keeps Coming Back

Because most people:

- use only eye drops
- get temporary symptom relief
- do not support the system

but they do NOT fix:

the root of the problem

CRITICAL INSIGHT

Insulin resistance does not simply cause:

“dry eyes”

It causes:

eyelid dysfunction
gland imbalance
tear film instability
poor visual quality

In other words:

a **SYSTEM DISORDER**

Treatments Patients Already Use

Many people with insulin resistance, prediabetes or early diabetes use:

- **Metformin**
(e.g. Glucophage, Siofor)
- **GLP-1 receptor agonists**
(e.g. Ozempic, Wegovy, Trulicity)
- **Insulin**
(in more advanced stages)

These treatments:

regulate blood sugar
improve metabolism
reduce long-term complications

BUT:

they do NOT restore:

- eyelid function
- tear film stability
- the microenvironment of the ocular surface

What No One Has Told You

MEDICATIONS PATIENTS ALREADY TAKE
Many common medications can contribute to dry eye, tear film instability and ocular surface inflammation.

These medications are often necessary – but they can be part of the problem. Understanding the connection is the first step to finding solutions.

ANTIHISTAMINES	ANTIDEPRESSANTS	ANXIETY / SLEEP MEDS	BLOOD PRESSURE MEDS	HORMONE THERAPIES
Examples: Loratadine (Claritin) Cetirizine (Zyrtec) Diphenhydramine (Benadryl) Fexofenadine (Allegra)	Examples: Amitriptyline (Elavil) Sertraline (Zoloft) Paroxetine (Paxil) Duloxetine (Cymbalta)	Examples: Alprazolam (Xanax) Clonazepam (Klonopin) Zolpidem (Ambien) Eszopiclone (Lunesta)	Examples: Beta-blockers (Metoprolol) Diuretics (Furosemide) ACE inhibitors (Lisinopril) Calcium channel blockers	Examples: Estrogen therapy Birth control pills Anti-androgens Testosterone blockers
How it affects your eyes: Reduce tear production Thicken mucus Increase dryness and irritation	How it affects your eyes: Reduce tear production Affect meibomian glands Blur vision, increase dryness	How it affects your eyes: Reduce blink rate Reduce tear production Lower tear production Increase dryness and instability	How it affects your eyes: Reduce tear production Alter tear film quality May cause blurred vision	How it affects your eyes: Affect meibomian glands Change tear film quality Increase dryness and irritation

ACNE MEDICATIONS	PAIN RELIEVERS	DIABETES MEDICATIONS	CHOLESTEROL MEDS	COMMON ADDITIONAL MEDS
Examples: Isotretinoin (Accutane) Tretinoin (Retin-A) Doxycycline (long-term)	Examples: NSAIDs (Ibuprofen, Naproxen) Opioids (Hydrocodone, Oxycodone)	Examples: Metformin Insulin Sulfonylureas GLP-1 agonists	Examples: Statins (Atorvastatin) Fibrates (Fenofibrate) Ezetimibe	Examples: PPIs (Omeprazole) Muscle relaxants Steroids (oral / inhaled) Immunosuppressants
How it affects your eyes: Shrink meibomian glands Reduce oil production Severe dry eye risk	How it affects your eyes: Reduce tear production Decrease corneal sensitivity Can worsen inflammation	How it affects your eyes: Fluctuating blood sugar Affects nerves and vessels Promotes dryness and damage	How it affects your eyes: May affect meibomian gland lipids and tear film stability Possible dry eye symptoms	How it affects your eyes: Reduce tear production Increase inflammation risk Affect healing and immunity

IMPORTANT NOTE
These medications are often essential and life-improving. The goal is not to stop them, but to minimize their impact on your eyes and support your ocular health.

THE BOTTOM LINE
Medications can contribute to eye problems → Awareness leads to better decisions → Address the root, support the system, restore balance → Better alignment = Better eyes, Better life.

WHY THIS MATTERS
These medications can reduce tear production, affect tear quality, and damage the ocular surface.
The more medications you take, the greater the cumulative effect.
Symptoms may be misdiagnosed as "just dry eye".
Never stop a medication without talking to your doctor.

WHAT YOU CAN DO
 Review your medication list with your eye doctor.
 Consider timing (e.g., drops away from medications).
 Focus on treating root causes and supporting your system.

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Your eyes are connected to everything. Smart medication management + Root cause care = Lasting relief.

Blood sugar regulation is essential but it is NOT enough for the eyes

Because:

the eyes function as their own system

And they require:

local restoration

(eyelids + tear film + behavior)

Can Metformin (Glucophage) Affect the Eyes?

What many people search for — but rarely find clearly explained

MEDICATIONS & VISION: WHAT TO KNOW

Certain medications used for blood sugar control can cause temporary changes in vision by affecting glucose levels and the eye's delicate systems.

1. METFORMIN (Glucophage)

WHAT TO KNOW

- ✓ Blood sugar changes
- ✓ Temporary blurred vision
- ✓ Tear film instability

HOW IT AFFECTS YOUR EYES

GLUCOSE FLUCTUATION → OSMOTIC CHANGES (fluid shifts) → EFFECT ON LENS & TEAR FILM = blurred vision, dryness, irritation

2. GLP-1 AGONISTS (Ozempic®, Wegovy®, Trulicity®)

WHAT TO KNOW

- ✓ Rapid glucose reduction
- ✓ Vision fluctuation
- ✓ Dry eye symptoms

IMPORTANT: Monitor if you have diabetic retinopathy.

HOW IT AFFECTS YOUR EYES

RAPID GLUCOSE REDUCTION → METABOLIC & OSMOTIC ADAPTATION → TEAR FILM INSTABILITY & OCULAR SURFACE = dry eye, irritation, fluctuating vision

3. INSULIN

WHAT TO KNOW

- ✓ Fast glucose shifts
- ✓ Lens swelling changes
- ✓ Focus instability

HOW IT AFFECTS YOUR EYES

FAST GLUCOSE SHIFTS → CHANGES IN LENS HYDRATION → FOCUS INSTABILITY = blurry or fluctuating vision

COMMON RESULT

Blurred or fluctuating vision, Dry eye & irritation, Eye fatigue & discomfort

GLUCOSE CHANGE → EYE SYSTEM IMPACT

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KEY INSIGHT

These are NOT direct drug side effects. They are results of metabolic changes that affect the eye system.

This impacts: TEAR FILM, EYELIDS, OCULAR SURFACE

VISION CAN FLUCTUATE WHEN BLOOD SUGAR CHANGES. STABILITY COMES FROM BALANCE.

If you notice persistent changes in your vision see your eye care professional.

Monitor your blood sugar. Protect your eyes. Protect your future.

OPHTHALMOGEN DERMOPHTHALMOLOGY

Yes — in some cases, people may experience:

- blurred vision
- eye fatigue
- mild dryness

What's Actually Happening

This is not a “side effect” in the classic sense.

It is the result of metabolic changes in the body.

When you start or adjust metformin:

- blood sugar changes
- osmolarity shifts
- the lens may be temporarily affected
- the tear film becomes unstable

Result:

blurred vision that comes and goes

When Does It Happen Most Often?

- at the beginning of treatment
- when the dose changes
- when blood sugar drops quickly

What You Need to Know

This does NOT mean:

that the treatment is harming you

It means:

your body is adapting

Here's the Critical Part

Even when blood sugar stabilizes:

the ocular system may remain dysregulated

Because:

- the glands have not recovered
- the tear film remains unstable
- the eyelids continue to dysfunction

Critical Insight

Metformin regulates blood sugar
but does NOT restore the foundation of vision

What This Means in Practice

If you experience:

- blurred vision
- dryness
- eye fatigue

it does NOT mean:

you need to change your medication

it means:

your eyes also need local support

Medical Note

If blurred vision:

- is severe
- persists
- worsens
- is accompanied by pain or double vision

you should consult a doctor immediately

Can GLP-1 Medications (Ozempic, Wegovy, Trulicity) Affect Vision?

Yes — in some cases.

Official information for Ozempic reports that **changes in vision** may occur, and that patients with a history of diabetic retinopathy should be monitored.

Mainly through:

- rapid changes in blood sugar
- metabolic shifts
- added stress on an already unstable visual system

This may lead to:

blurred vision
unstable focus
dry eye symptoms

What About Insulin?

Especially at the beginning of treatment or during rapid adjustments:

- blood sugar changes quickly
- the lens is affected
- focusing fluctuates
- the tear film becomes unstable

Result:

variable / fluctuating vision

The Common Mechanism

This is NOT a “side effect” in the classic sense

It is:

a result of metabolic changes in the body

The Solution: Dermophthalmology System Routine

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THE SOLUTION: DERMOPHTHALMOLOGY SYSTEM ROUTINE

Address the Root Causes. Restore the Ecosystem. Achieve Lasting Relief.

This is not just symptom management. This is system restoration.
Healthy eyelids. Stable tears. Clearer vision. Better life.

THE 5-STEP DERMOPHTHALMOLOGY SYSTEM ROUTINE

1 CLEANSE
Remove the Load

- Daily eyelid hygiene
- Remove biofilm, debris, excess oils & makeup
- Control Demodex
- Cleanse the lash line

Goal: A clean surface for healing to begin.

2 CALM & STABILIZE
Reduce Inflammation

- Reduce inflammation
- Calm the eyelids & ocular surface
- Support meibomian glands
- Reduce redness, irritation, burning

Goal: Calm the fire and stabilize the system.

3 RESTORE
Rebuild & Repair

- Restore the tear film
- Support gland function
- Replenish the ocular surface
- Repair microscopic damage

Goal: Rebuild the barriers. Restore natural function.

4 PROTECT
Shield & Strengthen

- Protect from environmental stressors
- Strengthen tear film stability
- Support long-term resilience
- Prevent new damage

Goal: Strengthen defenses. Prevent the cycle from returning.

5 MAINTAIN
Sustain the Balance

- Daily habits that support eye health
- Regular maintenance
- Monitor & adjust
- Long-term consistency

Goal: Keep the system in balance for the long term.

CORE PRINCIPLES

- Root Cause First**
We treat the underlying causes, not just the symptoms.
- System Approach**
Eyelids, glands, tears, microbes, inflammation, and lifestyle all connected.
- Personalized Care**
Your routine is adapted to your unique biology and needs.
- Evidence-Informed**
Science-based. Results-driven. Continuously refined.
- Empowerment**
You are an active part of your healing journey.

DAILY ROUTINE OVERVIEW

MORNING

- Cleanse eyelids
- Use prescribed products
- Protect & hydrate
- Support glands

DAYTIME

- Blink consciously
- Stay hydrated
- Manage screen time
- Protect from environment

EVENING

- Cleanse thoroughly
- Treat (as prescribed)
- Support & restore
- Prepare for healing

WEEKLY

- Deep clean / mask
- Heat therapy
- Evaluate & adjust
- Consistency is key

MONTHLY

- Review progress
- Adjust plan if needed
- Professional evaluation
- Keep the cycle strong

KEY SUPPORT PILLARS

- TEAR FILM SUPPORT**
Lipid + Aqueous + Mucin
Build a stable, healthy tear film.
- MEIBOMIAN GLAND HEALTH**
Open + Clear + Functioning
Good glands = Good tears.
- MICROBIOME BALANCE**
Healthy flora, controlled Demodex
Balance = Less inflammation.
- INFLAMMATION CONTROL**
Calm the immune response
Chronic inflammation breaks the cycle.
- LIFESTYLE & SYSTEM HEALTH**
Sleep + Nutrition + Stress + Hormones
Whole-body health supports eye health.

WHAT YOU CAN EXPECT

- Less dryness, burning, redness
- More stable tears
- Clearer, more comfortable vision
- Stronger eyelids & glands
- Fewer flare-ups
- Better quality of life

Real healing. Real results.
Real you.

THIS IS A JOURNEY, NOT A QUICK FIX
Healing takes time. But every step you take moves you forward. Consistency today, freedom tomorrow.

BREAK THE CYCLE. BUILD THE HEALTH.

OLD CYCLE
Inflammation
Damage
Symptoms
Temporary relief

NEW CYCLE
Cleanse + Calm + Restore
Protect + Maintain
Balance + Health
Lasting Relief

HEALTHY ECOSYSTEM
Stable tears
Comfort
Clarity
Confidence

REMEMBER
You are not alone. You do not have to live with dry, irritated eyes. There is a solution. We build it together.

DERMOPHTHALMOLOGY SYSTEM ROUTINE

Address the root. Restore the system. Transform your eyes. Transform your life.

Not just eye drops

but a **system-based routine**

This is where eye care needs to become:

- structured
- daily
- targeted

1. Heat Therapy with Ophthalmogen EYE10

For patients with insulin resistance, dry eye, fluctuating vision and gland dysfunction, **heat therapy is a foundational step.**

How it helps:

opens the Meibomian glands
liquefies thickened oils
improves gland flow
supports tear film stability

Practical use:

Ophthalmogen EYE10

15–20 minutes, controlled temperature ~40–42°C

Especially useful when patients experience:

- heavy or tired eyes
- fluctuating vision
- symptoms worsening with screens
- a feeling that “the eyes don’t open properly”

2. Daily Eyelid Hygiene with Ophthalmogen Gel

Eyelid hygiene is not a minor detail.

It is the foundation.

Ophthalmogen Gel helps:

cleanse the lash line
reduce biofilm
support microbiome balance
help control Demodex load
improve the eyelid microenvironment

Practical use:

gentle application / massage on eyelids and lash base
ideally after heat therapy or in the evening

Critical for these patients because:

- metabolic dysfunction affects eyelids
 - low-grade inflammation maintains irritation
 - artificial tears alone are often not enough
-

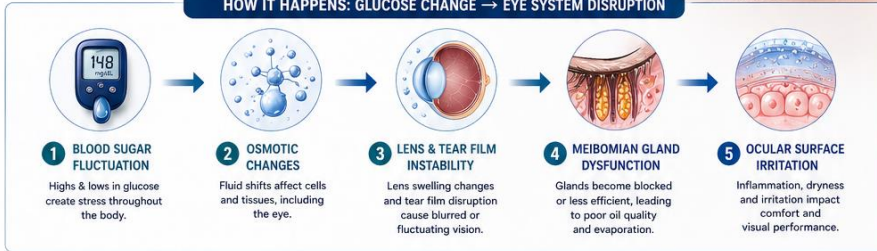
MEDICATIONS & VISION

FROM GLUCOSE TO EYE SYSTEM — AND HOW TO RESTORE BALANCE

Medications can help control blood sugar — but changes in glucose levels can impact your eyes. Understanding the connection is the first step to protecting your vision.



HOW IT HAPPENS: GLUCOSE CHANGE → EYE SYSTEM DISRUPTION



MEDICATIONS THAT CAN INFLUENCE YOUR VISION

<p>1 METFORMIN (Glucophage®)</p> <ul style="list-style-type: none"> ✓ Blood sugar changes ✓ Temporary blurred vision ✓ Tear film instability <p>HOW IT WORKS</p> <p>Vision usually stabilizes as glucose levels become consistent.</p>	<p>2 GLP-1 AGONISTS (Ozempic®, Wegovy®, Trulicity®)</p> <ul style="list-style-type: none"> ✓ Rapid glucose reduction ✓ Vision fluctuation ✓ Dry eye symptoms <p>IMPORTANT: Monitor if you have diabetic retinopathy.</p> <p>HOW IT WORKS</p> <p>Vision changes are often temporary but may be more noticeable with rapid drops.</p>	<p>3 INSULIN</p> <ul style="list-style-type: none"> ✓ Fast glucose changes ✓ Lens hydration changes ✓ Focus instability <p>HOW IT WORKS</p> <p>Vision may fluctuate during dose adjustments or glucose changes.</p>
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RESTORE THE SYSTEM — NOT JUST THE SYMPTOM — THE OPHTHALMOGEN® SYSTEM

<p>1 WARM COMPRESS (Ophthalmogen® EYE10)</p> <p>Delivers consistent heat to melt thickened oils and activate meibomian glands.</p>	<p>2 EYELID HYGIENE (Ophthalmogen® Gel)</p> <p>Removes biofilm, reduces bacteria and restores the eyelid microbiome balance.</p>	<p>3 DAILY SUPPORT (Ophthalmogen® Spray)</p> <p>Supports tear film stability, hydration and ocular surface comfort all day.</p>	<p>4 BEHAVIOR MATTERS</p> <ul style="list-style-type: none"> Reduce eye rubbing Be screen smart (20-20-20 rule) Sleep & stress management Hydration & nutrition support healing
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<p>KEY INSIGHT</p> <p>Vision changes are not just about the eye. They reflect systemic metabolic changes affecting:</p>	<p>TEAR FILM</p>	<p>EYELIDS & MEIBOMIAN GLANDS</p>	<p>OCULAR SURFACE</p>	<p>Stability comes from restoring the system. Better system. Better vision. Better life.®</p>
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SCIENCE. SYSTEM. BALANCE. Dermophthalmology is the bridge between skin and eye.

Understand the cause | Restore the system | Protect your vision

OPHTHALMOGEN® DERMOPHTHALMOLOGY

Always follow your healthcare professional's advice. Do not stop or change medications without medical guidance.

3. Tear Film Stabilization with Ophthalmogen Spray

A common mistake:

applying drops on an unstable, unprepared surface

Ophthalmogen Spray helps:

- hydrate the periocular microenvironment
- reduce itching and burning
- reduce the urge to rub the eyes
- support daily eyelid comfort

Practical use:

- during the day
- before long screen exposure
- before or between artificial tears

The Critical Detail

Before using artificial tears:

use **Ophthalmogen Spray**


or

perform gentle eyelid massage with **Ophthalmogen Gel**

Why?

- reduces irritation
- activates gland function
- reduces eye rubbing
- allows drops to work on a more stable surface

4. Reduce Eye Rubbing




WHY THE PROBLEM KEEPS COMING BACK

Because we treat the symptoms, not the system.
The cycle repeats until the root cause is addressed.

TEMPORARY RELIEF ≠ LONG-TERM SOLUTION

Eye drops, antibiotics or quick fixes may help for a short time, but if the root cause remains, the problem always returns.

THE NEVER-ENDING CYCLE




- 1 TRIGGER**
Inflammation, poor lid hygiene, Demodex overgrowth, stress, diet, hormones, screen time, etc. disrupt the balance.
- 2 INFLAMMATION STARTS**
Eyelid margins become inflamed. Glands are affected. Tear quality decreases.
- 3 SYMPTOMS APPEAR**
Dryness, irritation, burning, redness, blurred or fluctuating vision, watery eyes, styes (chalazia), blepharitis.
- 4 TEMPORARY RELIEF**
You use eye drops, antibiotics or other treatments. Symptoms improve... for a while.
- 5 ROOT CAUSE REMAINS**
The underlying issue (gland dysfunction, microbiome imbalance, inflammation, poor tear film, metabolic factors) is still there.
- 6 BALANCE BREAKS AGAIN**
The system becomes unstable again and symptoms slowly return.
- 7 THE PROBLEM COMES BACK**
You're back to square one – frustrated, tired, and searching for another quick fix.

WHY THIS HAPPENS

- The root causes are not addressed
Inflammation, Demodex, gland dysfunction, dysbiosis, insulin resistance, diet, stress.
- Tear film instability is not corrected
Poor quality tears evaporate quickly, so symptoms return.
- Glands stay blocked or underperforming
Meibomian glands need consistent care to function properly.
- The cycle is self-perpetuating
Inflammation → poor tears → more inflammation.

THE REAL REASON



WHAT PEOPLE TREAT
Symptoms (the surface)

WHAT CAUSES THE PROBLEM
Root causes (the deep part)

- Dryness
- Itchiness
- Irritation
- Blurred vision
- Watery eyes

- Inflammation
- Gland dysfunction
- Demodex & dysbiosis
- Tear film instability
- Hormones & metabolism
- Stress, sleep & nutrition

WHAT BREAKS THE CYCLE?

- Heat therapy**
Restores gland function and oil flow.
- Daily eyelid hygiene**
Removes biofilm, debris and reduces Demodex.
- Tear film stabilization**
Improves all layers of the tear film.
- Address root causes**
Inflammation, lifestyle, nutrition, insulin resistance, stress.
- Consistency**
Daily care = long-term stability.

THE GOAL IS NOT TEMPORARY RELIEF.
THE GOAL IS LASTING COMFORT & CLARITY.

BREAK THE CYCLE.
RESTORE THE SYSTEM.
KEEP YOUR EYES HEALTHY.

+ + =

HEAT daily + CLEANSE daily + SUPPORT throughout the day = STABLE TEARS. COMFORT. CLEAR VISION.

TREAT THE SYSTEM. NOT JUST THE SYMPTOMS.
That's how you stop the cycle and keep your eyes better for the long term.

OPHTHALMOGEN /
The 1st Dermophthalmology Brand

Eye rubbing:

- increases inflammation
- damages eyelids
- worsens gland function
- further destabilizes the tear film

In these patients, this is **critical**.

Integrated Benefit

Using:

- **Ophthalmogen Spray** during the day
- **Ophthalmogen Gel** for daily hygiene
- **Ophthalmogen EYE10** for gland activation

helps not only with symptom relief
but also reduces the need to rub the eyes

The Big Picture

This is not:

one product
one step

It is:

a **4-level system**

Meibomian glands → heat therapy (Ophthalmogen EYE10)
Eyelids / lash line → cleansing (Ophthalmogen Gel)
Tear film / daily comfort → stabilization (Ophthalmogen Spray)
Behavior → less rubbing, better stability

Conclusion

Yes — insulin resistance:

- affects vision
- causes dry eye
- creates instability
- impacts eyelids and gland function

Because it disrupts the entire system

Final Thought

If you treat only the eyes...

the problem comes back

If you restore the system...

you break the cycle

OPHTHALMOGEN /
The 1st Dermophthalmology Brand

Clear vision is more than blood sugar. It's about balance.

When medications and metabolic changes affect your eyes, the solution isn't just in one drop or one pill. It's in restoring the entire system.

“Your eyes adapt. Your treatment should too. Let's bring your vision back into focus.”

We see the whole picture — not just the symptom. We combine science with real-world dermatophthalmology. We restore balance to the eye system, tear by tear. We care for your eyes — and your quality of life.

OPHTHALMOGEN[®] DERMOPHTHALMOLOGY | A SCIENTIFIC SYSTEM. A PERSONAL PROMISE. | Evidence based | Dermatologically & ophthalmologically tested | Developed for sensitive eyes and real life | Trusted by patients & professionals

RESTORE THE SYSTEM. SEE THE DIFFERENCE.
The Ophthalmogen[®] System works in 4 essential steps to support eyelid health, tear film stability, and ocular surface comfort.

- 1 WARM COMPRESS (EYETO)**
Activates meibomian glands and melts thickened oils.
- 2 EYELID HYGIENE (GEL)**
Cleanses, balances the microbiome and supports healing.
- 3 DAILY SUPPORT (SPRAY)**
Hydrates, soothes and stabilizes the tear film.
- 4 BEHAVIOR MATTERS**
 - Reduce eye rubbing
 - Follow the 20-20-20 rule
 - Prioritize sleep & stress management
 - Hydration & nutrition support eye health

You can't always control your medications. But you can control how well your eyes feel every day.

Better comfort | Better stability | Better focus | Better life

YOU'RE NOT ALONE. We're here to help you see, feel and live better — every day.

Learn more. Take the first step toward better eye health.

SCIENCE. SYSTEM. BALANCE. | Dermophthalmology is the bridge between skin and eye. | Always follow your healthcare professional's advice. | OPHTHALMOGEN[®] DERMOPHTHALMOLOGY

FAQ – Insulin Resistance & Eyes

Can insulin resistance cause blurred vision?

Yes — mainly due to **blood sugar fluctuations** and **tear film instability**.

Why is my vision blurry during the day?

Because of:

- fluctuations in blood glucose
- instability of the tear film
- small temporary changes in the lens

Result: vision that comes and goes

Is it a glasses issue?

Not necessarily.

In many cases, it is **tear film instability**, not a refractive error.

Can insulin resistance cause dry eye?

Yes.

Through:

- chronic low-grade inflammation
- Meibomian gland dysfunction
- poor tear quality

Leading to dry eye symptoms

Why do my eyes water if they are dry?

Because:

- dryness triggers reflex tearing
- but the tears are often of poor quality
- and do not stay stable on the eye surface

Result: watery eyes that are still dry

Can insulin resistance cause blepharitis or chalazia?

Yes.

Through:

- microbiome imbalance
- gland dysfunction

Increasing the risk of:

- blepharitis
 - recurrent chalazia
-

Does metformin (Glucophage) cause blurred vision?

It can be associated with **temporary blurred vision**, especially:

- at the beginning of treatment
- when the dose changes

Due to changes in blood sugar levels — not a direct toxic effect.

How long does blurred vision from metformin last?

Usually temporary.

It may last from **a few days to a few weeks** as the body adapts.

Can Ozempic or other GLP-1 medications affect the eyes?

Yes, in some cases.

Mainly due to rapid metabolic changes.

Official Ozempic information mentions “**changes in vision**” and recommends monitoring in patients with diabetic retinopathy.

Are artificial tears enough?

No.

They provide temporary relief but do **not correct the root cause**.

What actually works?

A system-based approach:

- heat therapy
 - daily eyelid hygiene
 - tear film stabilization
 - reducing eye rubbing
-

What is the practical Ophthalmogen routine for these patients?

A structured daily protocol:

- **Ophthalmogen EYE10** → 15–20 minutes (heat therapy)
- **Ophthalmogen Gel** → eyelid cleansing & gentle massage
- **Ophthalmogen Spray** → daytime support & comfort

This combination targets the system — not just symptoms.

Do I need to clean my eyelids every day?

Yes.

Just like teeth need daily hygiene, **eyelids require daily care.**

When should I see a doctor?

If you experience:

- persistent blurred vision
 - eye pain
 - light sensitivity
 - frequent chalazia
 - sudden worsening of vision
-

FINAL MICRO SUMMARY

Insulin resistance affects the eyes
not only through blood sugar
but through the entire ocular system

The solution is not just eye drops
but **restoring the system**

CTA

If you have insulin resistance or prediabetes and eye symptoms:

don't treat only the symptoms

restore the system

info@ophthalmogen.com for a personalized protocol

Scientific Basis

The relationship between insulin resistance, ocular surface dysfunction, and visual instability is supported by both ophthalmological and metabolic research, highlighting the eye as a sensitive indicator of systemic imbalance (1–6).

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