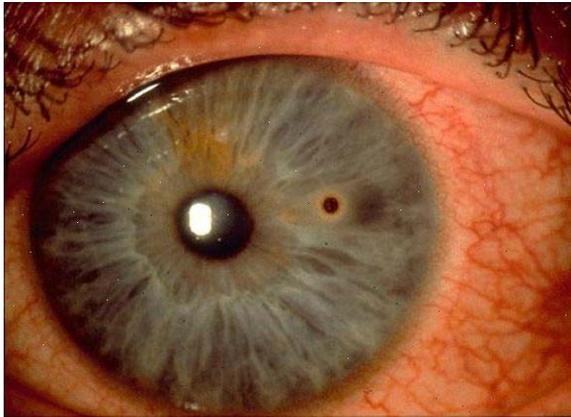


# Highland Fayette Clinton Safety Council Presentation

# Many eye injuries can happen on the job

- Corneal or conjunctival foreign bodies
- Welder's burn
- Chemical burn

# Foreign body



Corneal Foreign body

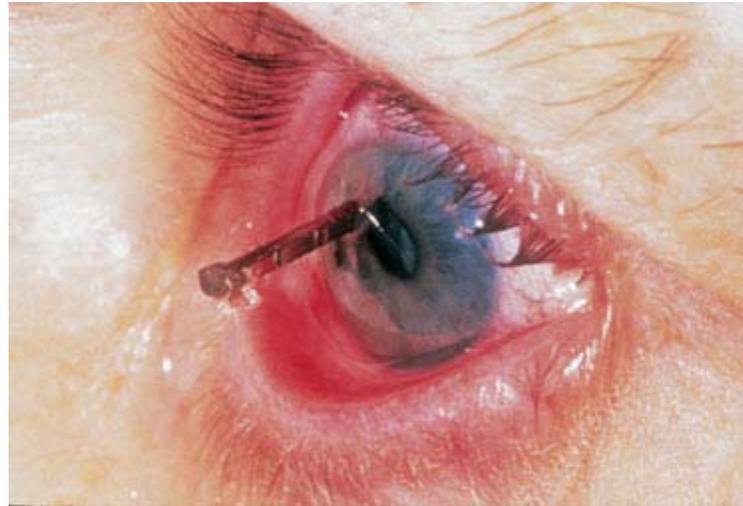


Conjunctival Foreign body

- Corneal foreign bodies usually are from welding or grinding metal  
Typically presents with a red, watery, painful, light sensitive eye with some people being able to see the black spot on their eye  
Typically removed with special tools in the office and the rust has to be ground out of the eye which can cause some corneal scarring

- Conjunctival foreign bodies can be from numerous causes such as grass, seeds, bug wings, dry wall, plastic  
Typically presents with a feeling of something in their eye, a scratching sensation when they blink, and watering  
More easily removed with a cotton swab

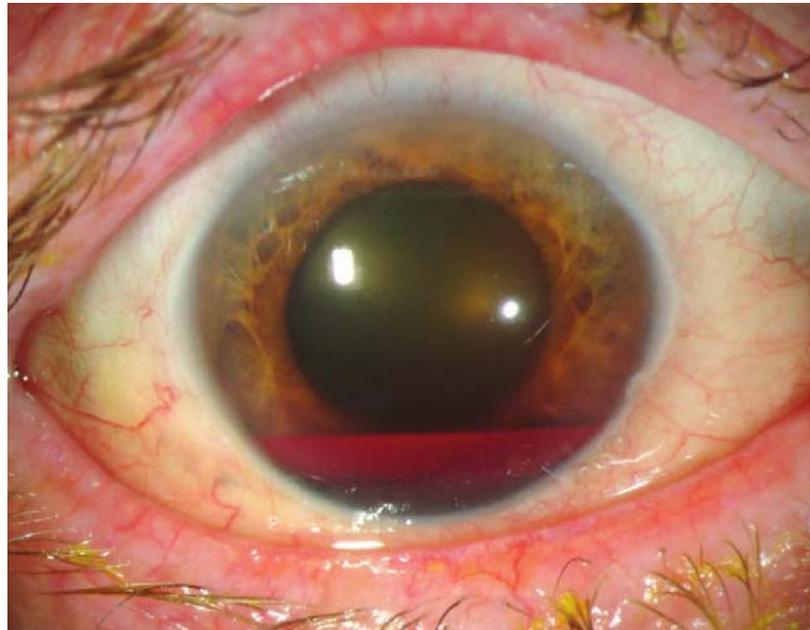
# Penetrating foreign body



If there is a foreign body entering the eye it is considered an emergency.  
DO NOT PULL THE NAIL OUT! Place a cup over it and tape the cup in place until seen.  
If you remove it yourself the fluid can leak out which makes it a lot worse.  
Do not stop at our office.  
Best plan is to go to the Cincinnati Eye Institute immediately! This will be surgically repaired then removed.  
They will perform a CT scan to determine how far the object is before removal.

# Blunt ocular trauma

- Sometimes can cause no visible problems immediately, other times can cause bleeding within the eye
- Worry about glaucoma long term even if no other issues
- We recommend periodic monitoring of intraocular pressures



# Blepharitis



Represents bacterial overgrowth on the eyelids and eyelashes and looks like flakes or dead skin on the base of the eyelashes

We all have bacteria that are normally present some people have more than normal.  
It can be environmental

Common in farming, construction, lawn care, and any other “dirty” environment

Easily treated with lid scrubs to address the cause (bacterial, inflammatory etc)

# Welder's burn



Essentially a sunburn of the front of the eye due to looking at a welder's torch or other source of ultraviolet light. Can take up to 3-12 hours to cause symptoms.

Symptoms include pain, redness, light sensitivity, watering, blurred vision, and foreign body sensation

Usually both eyes but can be asymmetric and affect the eye closer or more exposed to UV light

Need to see an optometrist if there is blurred vision, worsening eye pain, or mucousy discharge that could indicate an infection

# Potatoes, cucumbers, and milk?



Potatoes, Cool compresses, cucumbers, and tea bags have all been used as a home Remedy for welder's burn. As you can see they all cause you to close your eyes and place something cool over the eyes.

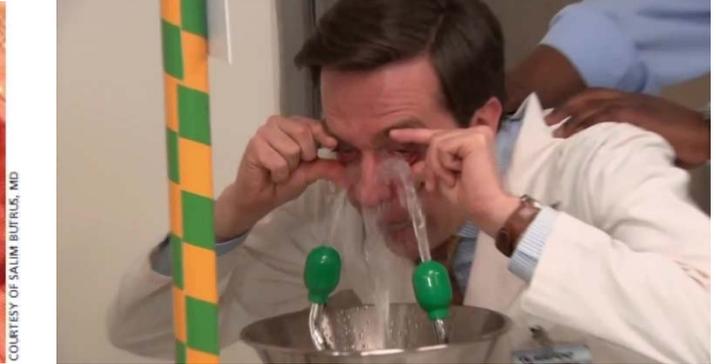
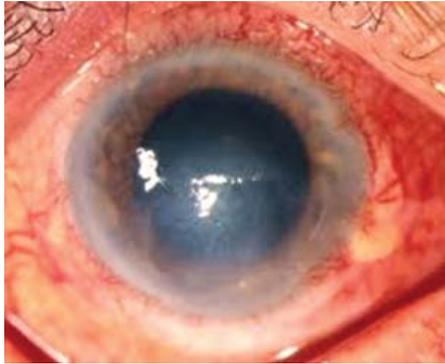


Some other home remedies that have been tried that are not recommended are boiled milk in the eye and rose water or almond oil around the eyes.

# Welder's burn: what we recommend

- Any form of a cool compress. I have no problem with placing tea bags, cut up cucumbers, or potatoes over closed eyes. The main benefit is just closing and resting the eyes and the cold will decrease inflammation
- Use an over the counter artificial tear such as Refresh Optive Advanced or Refresh Optive Gel depending on how bad it is
- Take ibuprofen if you can for pain and to decrease inflammation
- If the pain is severe or is worsening call our office
- If there is blurred vision that doesn't improve with home treatment call our office

# Chemical burns



Acids or bases can burn the eye

Bases penetrate further into the eye causing more damage (even HOURS later)

Acids coagulate proteins forming a protective barrier although they feel worse initially

Causes necrosis (death) of conjunctival and corneal tissue which can lead to corneal opacification, vascularization, and scarring

Treat with **COPIOUS IRRIGATION IMMEDIATELY**, then call our office for further evaluation . Irrigation should last at least 15 minutes, may want to do longer for base to neutralize the pH

# Safety glasses: Z87 vs Z87+

- Safety glasses have to meet ANSI standards and fall into two categories
  - Z87 indicates basic impact
  - Z87+ indicates high impact
  - All prescription frames must meet Z87+ requirements

# Basic impact(Z87) lenses

- Lenses shall be a minimum of 3.0 mm thick except for those lenses having a power of +3.00 or more, which shall have a minimum thickness of 2.5 mm
- 100 percent of glass lenses shall be tested
- Plastic lenses shall be statistically sampled
- Basic impact lenses will not be marked with a “+”
- Glasses with basic impact lenses will be delivered to the wearer bearing a warning label indicating they only meet the Basic Impact Standard

# High impact (Z87+) lenses

- Lenses must not be less than 2.0 mm thick
- Lenses passing high-impact test requirement will include “+” mark
- Lenses must pass the high mass test which consists of dropping a 500 gram pointed weight from 5 feet onto the lens. The lens must not break or fall out of the frame.
- Lenses also must pass the high velocity impact test where a ¼ inch steel ball is fired at the lenses at a speed of 150 feet/sec and again the lenses must not break or fall out of the frame.

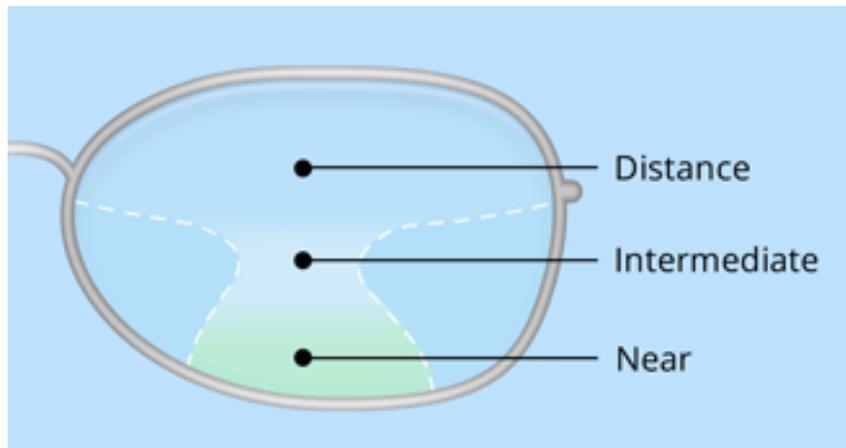
# Office jobs can cause problems too!

- Computer vision syndrome
- Eye strain
- Dry eyes
- Damage from blue light?

# Computer vision syndrome

- Associated with too much time spent on computers and electronic devices
- Causes dry eyes, eye fatigue, headaches, neck pain, blurry vision
- No one blinks enough while looking at the computer screen causing some of the issues
- Keys to help alleviate:
  - Blink more and treat dry eye as needed
  - 20-20-20 rule(every 20 minutes look 20 feet away for 20 seconds)
  - Minimize overhead lighting directly over your computer, watch for glare from windows, desk lights, etc
  - Set the computer monitor about 20-24 inches away with the center of the screen about 4-6 inches below your eyes
  - Wear the glasses that have been prescribed

# Eye strain



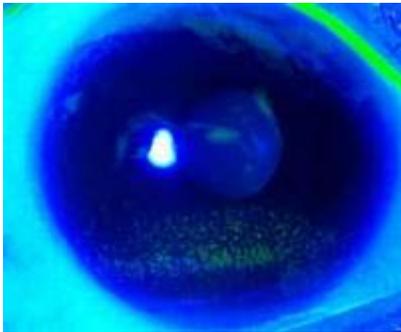
**ESSILOR® Eyezen™**

THE NEW SINGLE VISION LENSES AS PRIMARY PAIR FOR AMETROPES OR IN PLANO FOR EMMETROPES. WITH 3 OPTIMIZATIONS DEPENDING ON PROFILES:

YOUNG ADULTS 20 - 34 years old	PRE-PRESBYOPES 35 - 44 years old	EMERGING PRESBYOPES Without near vision correction 45 - 50 years old
ESSILOR EYEZEN INITIAL 0.4	ESSILOR EYEZEN ACTIVE 0.6	ESSILOR EYEZEN ACTIVE+ 0.85
STANDARD CORRECTION +	STANDARD CORRECTION +	STANDARD CORRECTION +
 WITH <b>+0.4D</b> TO RELAX EYES OF <b>20-34 YO</b> FROM DIGITAL STRESS	 WITH <b>+0.6D</b> TO RELAX EYES OF <b>35-44 YO</b> FROM DIGITAL STRESS	 WITH <b>+0.85D</b> TO RELAX EYES OF <b>45-50 YO</b> FROM DIGITAL STRESS
PROTECTION FROM UV & HARMFUL BLUE-VIOLET LIGHT EMITTED BY SCREENS. REDUCED SCREEN GLARE & IMPROVED CONTRASTS.		
THANKS TO CRIZAL® PREVENICA™		

- Using the computer and reading for long periods of time can cause eye strain, eye fatigue, and headaches
- Glasses help relieve the strain by decreasing the amount of focusing required
- Can use single vision “anti-fatigue” lenses, trifocals, or progressive addition lenses(no-line bifocals)
- Glare off of computer screens contributes as well which can be improved with an anti-glare coating

# Dry eye syndrome



## Symptoms include:

- dry, sandy, gritty sensation
- foreign body sensation
- blurry vision that can give the feeling of a film coming over vision
- redness
- watering



There are many treatments from over the counter to prescription medications

- artificial tears
- lid scrubs to decrease inflammation of oil producing glands
- punctal plugs
- Restasis or Xiidra
- autologous serum
- bandage contact lenses, scleral contact lenses, and amniotic membrane lenses for severe cases

# Mask Associated Dry Eye (MADE)

Wearing masks is essential to helping reduce the spread of COVID-19, but may lead to symptoms of dry eye. Why does this occur and what can you do?

## Cause

1 Air from breathing out is channeled up, out the top of the face mask, and over the surface of the eye.<sup>1</sup>



2 Movement of air over the eye causes tears to evaporate, leaving the surface of the eye dry.



3 Eyes may feel dry, gritty, irritated, itchy, watery and look red.



## Solution

1 Ensure your mask fits well, and consider taping the top edge of the mask for prolonged wear.



2 Lubricating eye drops may help alleviate dry feeling eyes. Consult with your eye care professional for their recommendation.



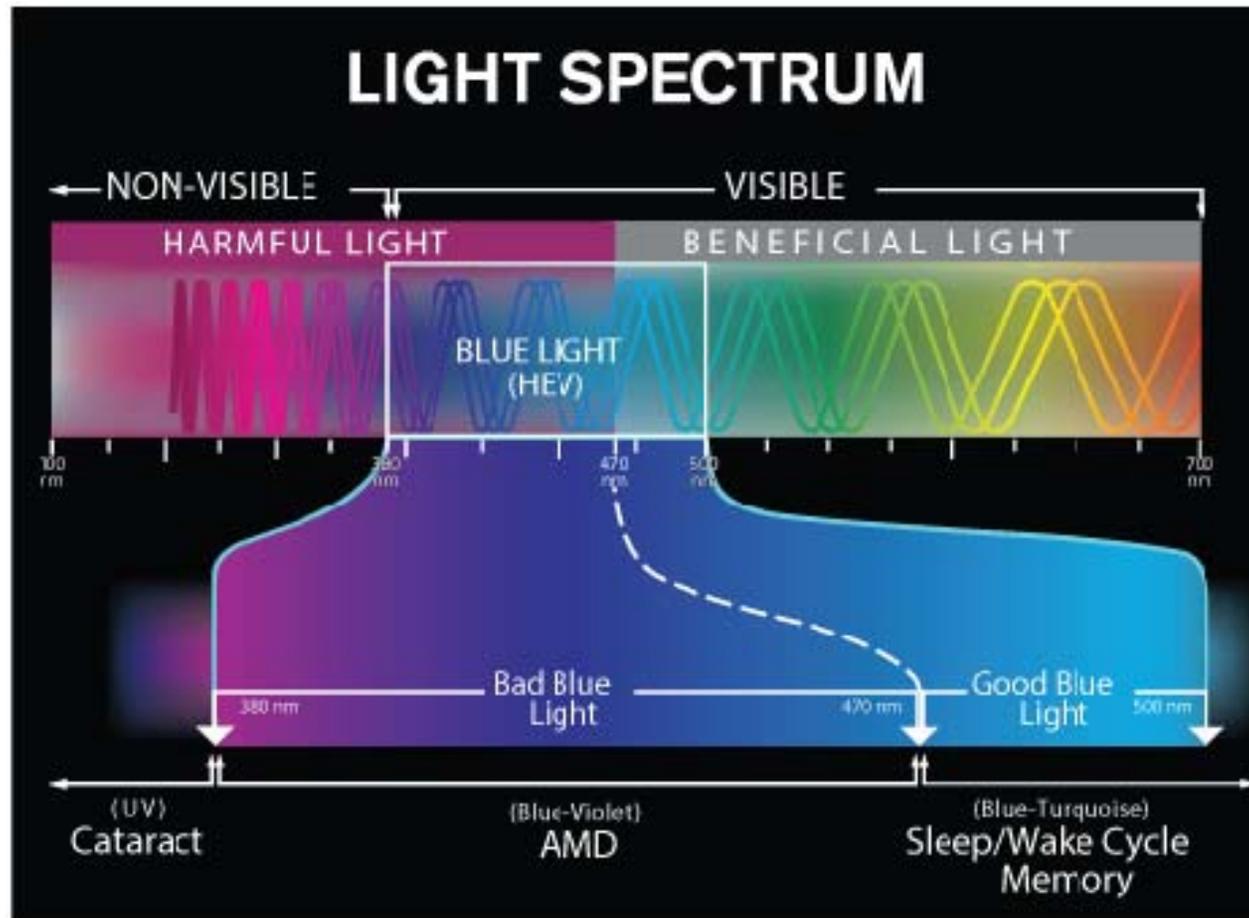
3 Limit time in air-conditioned environments where possible, and take regular breaks from digital devices.

**Remember! Avoid touching your face and rubbing your eyes with unwashed hands.**

# Blue light danger

- According to a 2015 survey 60% of adults are on digital devices for more than six hours a day and 28% for more than ten hours a day
- We don't yet fully understand the consequences of this increased screen time
- One area of concern is the effects of short wavelength blue light or high energy visible blue light( HEV)

# HEV (blue light)



HEV is the light found in the 380 nm to 500 nm range(violet to violet blue end)

# HEV (blue light)

- This light is everywhere including:
- Sunlight(still main culprit with 25-30% of it's emissions in HEV range)
- Digital devices
- Ambient lighting used now (35% of cool white light LED emissions are in the HEV range while 26% of compact fluorescent light is in HEV range) (Incandescent bulbs only have 12% of their emissions in the HEV range)
- The amount of light from artificial sources is a fraction of the radiation emanating from sunlight-a typical LED emits 50-70 lux while sunlight provides 100,000 lux!

# HEV (blue light)

- We understand the effects of ultraviolet and infrared light but HEV is not well understood
- HEV studies continue and based on current studies the effects can be divided into three broad categories
  - 1. circadian rhythm
  - 2. medical treatments
  - 3. ocular effects

# Circadian rhythm

- Melatonin is a hormone that regulates our sleep cycle. The secretion by the pineal gland increases soon after the onset of darkness, peaks in the middle of the night(2am-4am) and decreases during the second half of the night. It also has a secondary role as an antioxidant.
- Several studies show how exposure to HEV before bed inhibits melatonin release due to absorption by special photoreceptors.
- The delayed release of melatonin was shown to delay sleep, decrease REM sleep, and increased next day fatigue
- Take away: put away the digital devices 2-3 hours before bed and turn on blue blocking filters on devices

# Blue Light exposure isn't always bad

- Evidence shows that the use of blue-enriched, white fluorescent lighting in an office setting improves alertness, positive mood, concentration, and evening fatigue when compared to white fluorescent lighting.

# Medical treatments with HEV

- Some studies are looking at using light therapy for Alzheimer's and Parkinson's
- Some are looking at HEV as a way to increase mental alertness
- Infants with jaundice receive blue light therapy to break down the bilirubin from red blood cell breakdown



# Ocular effects from blue light

- Some studies are showing there may be an increased risk of age related macular degeneration from HEV exposure. It increases the production of chemicals such as hydrogen peroxide within the retina which can cause damage to the photoreceptors
- The results are inconclusive at this point and may be over exaggerated. For instance one study equated 8 hours staring at a screen to 15 minutes of UV exposure.
- Blue light implicated as a contributing factor to computer vision syndrome

# What to do about blue light

- Eat a diet that has foods high in omega 3 fatty acids (tuna, salmon, walnuts, chia seeds, avocado) and lutein/zeaxanthin pigments( spinach, kale, paprika, red and cayenne peppers, basil)
- If you suffer from computer vision syndrome make sure to get antifatigue lenses such as Eyezen which incorporates a coating to block blue light
- Turn on Night Shift for your iPhone or add a blue light reducing app to your Android device
- Buy a blue light protective computer screen cover (Amazon)
- Reduce risky behavior such as smoking, poor diet, and unprotected sun exposure



# Thank you!

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