


# Safety in Optometry

KOA fall conference: 22 Sept 2023

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## How comfortable are you treating and managing industrial/safety injuries

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**BANNED**

**"Ban" this man!**

**KOA** KENTUCKY OPTOMETRIC ASSOCIATION


**Paraoptometric**

Lectures Presented by:

**Friday**  
Sharon Carter

**Saturday**  
Ban Leonard, O.D.  
Nikie Walker, Ed.D.  
Sharon Walker

### Dr Ben Leonard



- Doctor of Optometry, along with a Bachelor of Science, from Nova Southeastern University in Ft Lauderdale, FL
- Primary owner of EyeCare Associates of Kentucky- Calvert City, before joining EyeCare Partners
- Consultant for Anthem Insurance and CooperVision
- Member the American Optometric Association and the Kentucky Optometric Association

## Insert Avery "safety" video

### My optical & safety background

Future Optics, Jackson TN: Private lab, serviced the west TN area



### My optical & safety background

Calvert City industrial complex  
17 industrial facilities  
Almost 50% of county's jobs  
3000+ total jobs  
Safety culture



## Why safety eyewear?

<https://aoa.uberflip.com/1492068-cbo-adult-guidline-22/31?>

### c. Protection from Eye Injury

Eye injury is an important contributor to the burden of vision impairment and blindness in the United States. Many individuals are unaware of the ocular hazards they face, particularly at home or while playing sports.<sup>186</sup> Most eye injuries are preventable with appropriate use of protective eyewear.<sup>187,188</sup> It is, therefore, important to discuss eye safety issues with patients, including eye hazards at work, school, or home and during recreational activities.<sup>189</sup>

Eye trauma occurs more frequently during the spring and summer months. Prevention efforts would likely be most effective if implemented in this timeframe and if targeted to men and those under age 60.<sup>190</sup> (Evidence Grade: D) In persons ≥ 65 years of age, most eye injuries from consumer products occur in men, at home and involve chemical injuries. The most preventable injuries were those that occurred during construction and resulted in contusions and abrasions. Many of these injuries can be prevented through the use of safety glasses.<sup>191</sup> (Evidence Grade: B)

- Sports and recreation

Approximately 30,000 individuals present annually to emergency departments in the United States with sports-related eye injuries. Injuries occur most commonly in males and happen most frequently as a result of playing basketball, baseball, or softball, or shooting an air gun.<sup>192</sup> Although contact sports have not been shown to result in a higher prevalence of severe ocular injury, evaluation of athletes should occur prior to their commencing contact sports and on an ongoing basis, as eye and vision problems may increase with age and duration of activity.<sup>193</sup> (Evidence Grade: B)

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- **Workplace injuries**  
As a group, individuals aged between 18 and 54 years are at high risk for chemical injuries in the workplace. Continued efforts by the Occupational Safety and Health Administration to strengthen and enforce regulations associated with protective eyewear in the workplace are important to preventing chemical eye injuries.<sup>194</sup> (Evidence Grade: D)
- **Laser eye protection**  
The effect of lasers on the eye depends on various factors, including pupil size, pigmentation, laser pulse duration and repetition, and wavelength. Different wavelengths will penetrate the eyes to different levels and may cause damage to the cornea, lens or retina. Laser eyewear can be used to attenuate the laser radiation for eye protection. Laser safety glasses must meet very specific requirements and should be labeled per the American National Standards Institute (ANSI) Z136.1 Standard for the Safe Use of Lasers.<sup>195</sup>  
High-powered recreational lasers with the potential to cause severe ocular injuries are becoming increasingly available to the general public. The expanding use of lasers in everyday life increases the risk of injuries associated with laser exposure.<sup>196</sup> (Evidence Grade: D) Natural protective responses such as the blink reflex, pupillary constriction, and aversive head-turn response typically minimize sustained ocular exposure, but do not prevent accidental laser eye injuries from occurring. Most reported cases of laser injuries occur in occupational environments.<sup>197</sup>  
**Clinical note:** Clinicians should be aware of the signs and symptoms of ocular laser injuries. Vision loss usually occurs immediately after laser exposure. The primary mode of prevention is with appropriate eye protection using goggles specifically matched to the laser's wavelength.<sup>198</sup>

- **Use of protective eyewear**  
Dress prescription eyeglasses are not an adequate substitute for protective eyewear meeting the ANSI Z-87.1 Standard for Occupational and Educational Eye and Face Protection Devices. Spectacle wearers need to be made aware of the potential risks associated with wearing dress prescription eyeglasses during medium- to high-risk activities. The protective ability of eyewear is dependent upon the frame and lens as a complete unit.<sup>199</sup> (Evidence Grade: D)  
The 2016 National Health Interview Survey found that use of protective eyewear has been increasing in the United States, and individuals who are older, male, white and who wear corrective lenses are more likely to use protective eyewear during recreational activities. Also, a recent visit with an eye care practitioner appears to increase the likelihood of an individual using protective eyewear.<sup>200</sup> (Evidence Grade: D)  
Monocular patients are often not informed of the necessity of eye protection to improve the long-term visual prognosis of the remaining functional eye. Clinicians should make a point of recommending eye protection to all monocular patients.<sup>200</sup> (Evidence Grade: D)

**CONSENSUS-BASED ACTION STATEMENT:** Eye doctors should counsel their patients who are monocular or, when indicated, at-risk for ocular injuries to wear appropriate eye protection with impact resistant properties.

**Evidence Quality:** An evaluation of published research to support or refute the use of this recommendation was not conducted for this guideline.

32 aoa.org

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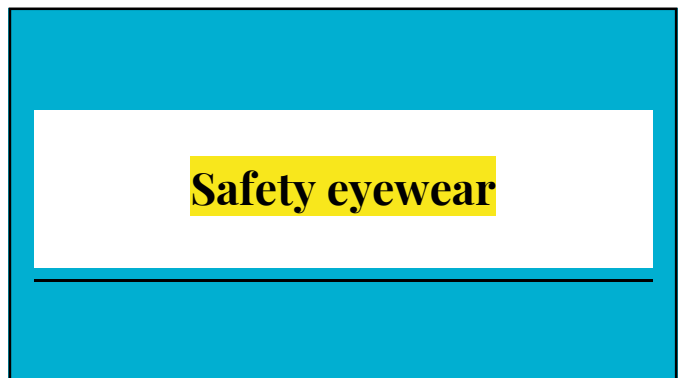
**Benefits and Harms Assessment:** Implementation of this recommendation is likely to increase patient's use of eye protection based on their personal risk factors. The benefits of this recommendation were established by expert consensus opinion.

- **Ultraviolet radiation protection**  
Patients should be advised about the need to protect their eyes from exposure to ultraviolet (UVA and UVB) radiation. Exposure to high levels of UV radiation can cause photokeratitis and photoconjunctivitis. Chronic exposure to even low levels of UV radiation is a risk factor for developing cataracts, pterygium, squamous cell carcinoma of the cornea and conjunctiva, and skin cancer.<sup>201</sup>

**CONSENSUS-BASED ACTION STATEMENT:** Since exposure to ultraviolet radiation (UV) is a risk factor for disorders of the eye, eye doctors should advise their adult patients about the benefits of the regular use of sunglasses that effectively block at least 99 percent of UVA and UVB radiation and the use of hats with brims when outdoors.

**Evidence Quality:** An evaluation of published research to support or refute the use of this recommendation was not conducted for this guideline.

**Benefits and Harms Assessment:** Implementation of this recommendation is likely to decrease patient risk of eye health problems from chronic exposure to UV radiation. The benefits of this recommendation were established by expert consensus opinion.



**ANSI standard review**

"This standard sets forth criteria related to the general requirements, testing, permanent marking, selection, care, and use of protectors to minimize the occurrence and severity or prevention of injuries from such hazards as impact, non-ionizing radiation and liquid splash exposures in occupational and educational environments including, but not limited to, machinery operations, material welding and cutting, chemical handling, and assembly operations. Certain hazardous exposures are not covered in this standard. These include, but are not limited to: Bloodborne pathogens, X-rays, high energy particulate radiation, microwaves, radio-frequency radiation lasers, masers, and sports and recreation."

<https://www.cdc.gov/PPEInfo/Standards/Info/ANSI/ISEAZ8712020>

**ANSI standard review**

**CDC** Centers for Disease Control and Prevention  
CDC 24/7: Saving Lives, Protecting People™

<https://www.cdc.gov/PPEInfo/Standards/Info/29CFR1910133>

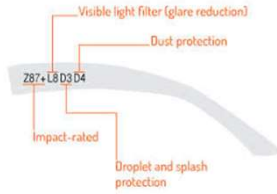
"Eye and face protection"

The employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

<https://www.cdc.gov/PPEInfo/Standards/Info/ANSI/ISEAZ8712020>

### ANSI standard review

- ANSI standards, and markings Z87 and Z87+, indicate that eyewear provides wearers with protection against impact hazards.
- The addition of the plus sign next to the Z87 marking indicates that the eyewear has been subjected to a much tougher set of tests, specifically the high mass impact test and the high velocity impact test.
- Z87-2 indicates that all criteria are met, and that the lenses are prescription



### Testing Safety lenses

- Both Rx and non-Rx safety eyewear must pass regular impact testing
- Drop ball impact and projectile or penetration impact testing are done on a regular basis at optical labs



### Safety eyewear links from this April KOA One Stop

<https://plantcaretoday.com/safety-glasses-osa-approved-ppc-eyes.html>

[https://plantcaretoday.com/protect-your-eyes-garden.html?fbclid=IwARzOj8ID4mSf9\\_ICQp0B EoiG1LU-9D6C43GunCor5KeP36HpyJkP4EFXSNc](https://plantcaretoday.com/protect-your-eyes-garden.html?fbclid=IwARzOj8ID4mSf9_ICQp0B EoiG1LU-9D6C43GunCor5KeP36HpyJkP4EFXSNc)



### Safety eyewear lens markings

- L-Visible Light Transmittance (L, with a scale number)
- W-Welding filter
- U-UV light scale rating
- R-Infrared filter rating
- V-photochromic designation
- X-fog test rating
- H-small head frame
- S-special lens tint designation
- D-D<sub>3</sub> splash/droplet protection, D<sub>4</sub> dust particles, D<sub>5</sub> fine dust



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What does the "V" marking stand for?

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What happens when safety eyewear isn't enough?

**What is OSHA?**

- With the Occupational Safety and Health Act of 1970, Congress created the Occupational Safety and Health Administration (OSHA) **to ensure safe and healthful working conditions for workers by setting and enforcing standards and by providing training, outreach, education and assistance.**
- Most large entities have at least one dedicated safety person who records and communicates with OSHA; that person is responsible for monitoring working conditions and specific occurrences/events
- Why? Because eye injuries alone cost companies \$300 million+ annually in lost production, medical expenses, & workers comp
- <https://www.osha.gov/aboutosha>

**OSHA and Recordable/Non-Recordable Events**

Per OSHA, some occurrences/events are deemed significant enough to "record" So, what makes an event "recordable"?

- Days away from work: if a physician approves days away from work, starting the day after the occurrence, even if the employee chooses not to stay home
- Restricted work or job transfer after the day of occurrence: (Sometimes if it's marginal, I will send pt back to work without restrictions, but off the record recommend they stay away from windy/dusty areas, no cutting/grinding, and/or maybe catch up on computer training if possible)
- Medical Treatment (prescription), excluding "First aid" (see OSHA standard)

<https://www.osha.gov/laws-regs/regulations/standardnumber/1904/1904.7>

**OSHA and Recordable/Non-Recordable Events: FIRST AID defined**

OSHA standard 1904.7(b)(5)(i)(B): the conduct of diagnostic procedures, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (e.g., eye drops to dilate pupils); or "First aid" as defined in paragraph (b)(5)(ii)

1904.7(b)(ii)(E): using hot or cold therapy

1904.7(b)(5)(ii)(I): using eye patches

1904.7(b)(5)(ii)(J): removing foreign bodies from the eye using only irrigation or a cotton swab

**Charting/Coding Safety Events at the Office Visit**

What we do, and how we chart it, can make the difference between a recordable and non-recordable event.

Things to focus on when a safety/injury comes in to the office:

- Start with a good chief complaint
- Record all gt, procedures, & devices used
- Know and use appropriate codes
- Send safety report



**Charting/Coding Safety Events at the Office Visit**

Chief Complaint:

1. Write what you see (objective) and what they say (subjective)
2. Ask what drops they've taken, and what measures they've tried (flushing, hot, cold, etc.)
3. Is this Workman's Comp?
4. FU appt: ask about use of Rx/recommend gt and/or medications
5. FU appt: is device, tape, plug, BSCL and/or amniotic membrane in place?

Example anyone???



**Charting/Coding Safety Events at the Office Visit**

Record **all** gt, procedures, & devices used

Diagnostic v Rx gt

BSCL, membrane

What tools were used: alger, spud, swab

Spud v swab

irrigation/flush?



### Charting/Coding Safety Events at the Office Visit

Use appropriate codes

- ICD-10 codes (T15, S05, etc)
- CPT codes (99xxx)
- Surgical codes
  - 65435-Debridement
  - 65778-Amniotic membrane
  - 92071-BSCL
  - 65222-KFB removal
  - 25 modifiers
- ALWAYS send a report to the safety dept: for your sake, and to build the relationship with your local industry (akin to DM reports to PCP)

### Connect with your local industries

- Which products do your local industries utilize, produce, come in contact with, etc.
- Do they have any specific procedures/protocols?
- Is there a local community advisory group to connect with?
- It's better to know ahead of time, than to scramble, google, and call for info when an event has already occurred



## Case Studies: Documenting a safety/injury OV

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Is it a "recordable"?

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### Case #1

25 y/o WM, presents with insult to OS; he experienced a paper cut in office of waste disposal facility; no drops or flushing at site, pt came straight to OD office; pt very light sensitive, epiphora

Vase: OD 20/20, OS 20/30- Ta: 16/14

SLE: linear +NaFl staining, tr AC Rxn

Impression: S05.02XA (initial K injury w/o FB)

Plan: 1 gt Prop in office, eRx Ab gt QID OS; NP as needed; tape lid for sleep; RTC 1 day, send report to safety dept

FU: RTC 1 day for K eval, K clear, no staining; D/C Ab gt, NP AT QID x 1 week; RTC PRN, report to safety dept



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Case #1: Is it a recordable event?

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**Case #1**

25 y/o WM, presents with insult to OS; he experienced a paper cut in office of waste disposal facility; no drops or flushing at site, pt came straight to OD office; pt very light sensitive, epiphora

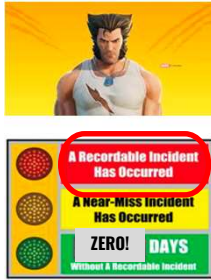
VAsc: OD 20/20, OS 20/30- Ta: 16/14

SLE: linear +NaFl staining, tr AC Rxn

Impression: S05.02XA (initial K injury w/o FB)

Plan: 1 gt Prop in office, eRx Ab gt QID OS; NP as needed; tape lid for sleep; RTC 1 day, send report to safety dept

FU: RTC 1 day for K eval, K clear, no staining; D/C Ab gt, NP AT QID x 1 week; RTC PRN, report to safety dept



**Case #2**

19 y/o WM, presents due to FBS OD. Event occurred at work while pt was removing old duct work from overhead. Excessive debris fell into the patient's eye. pt was wearing safety glasses at the time of event. Pt rubbed and irritated his eyes. No improvement to FBS with flushing or artificial tears. Pt does not wear contacts. Pt reports mild photophobia.

VAsc: OD 20/20-, OS 20/20 Ta: 14/14

SLE: multiple FB/debris in conj sac OD, K clear to NaFl, 1+ AC Rxn, tr edema

Impression: T15.11XA (Conj FB OD initial)

Plan: Removed conj FB with swab, 1 diagnostic gt of Tropicamide; Recommend NP AT OD x 1 week, RTC 1 day for K check, send report to safety dept

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**Case #2: Did the cyclo gt share the status of this OV to a "recordable" event?**

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**Case #2 (alternate ending)**

19 y/o WM, presents due to FBS OD. Event occurred at work while pt was removing old duct work from overhead. Excessive debris fell into the patient's eye. pt was wearing safety glasses at the time of event. Pt rubbed and irritate his eyes. No improvement to FBS with flushing or artificial tears. Pt does not wear contacts. Pt reports mild photophobia.

VAsc: OD 20/20-, OS 20/20 Ta: 14/14

SLE: multiple FB/debris in conj sac OD, K clear to NaFl, 1+ AC Rxn, tr edema

Impression: T15.11XA (Conj FB OD initial)

Plan: Removed conj FB with swab, 1 gt of Tropicamide to relieve photophobia and resolve AC Rxn; Recommend NP AT OD x 1 week, RTC 1 day for K check, send report to safety dept

**Case #3**

55 y/o WF, presents with chemical burn (carbopol) to OS

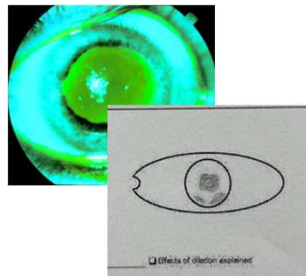
Eye was flushed at industrial site with 500ml. of sterile solution; administered proparacaine by onsite nurse, Morgan lens was used to flush the eye

VAsc: OD 20/25, OS 20/80 (NI PH); Ta: 18/18

SLE: matter on lid margins/lashes, 2+ conj injxn, central K epi absent +NaFl staining, ++ AC Rxn

Impression: S05.02XA (initial K injury w/o FB), Z77008 (chemical burn)

Plan: Removed matter from lids w/swab, debrided wound; Ab gt qzh, NP AT q15mins; tape lid for sleep; RTC 1 day, send report to safety dept



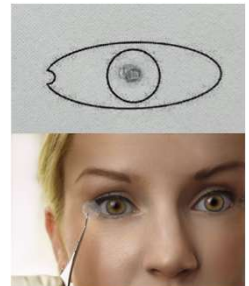
**Case 3 ctd**

RTC 1 day, VA improved, ++FBS, discomfort; gt compliant with Ab and NP AT, lids matted in AM

VA: OD 20/30, OS 20/25, OU 20/25; Ta 17/19

SLE: lids clear, 1+ injxn, central K stain, improved from yesterday, 1+ AC Rxn

Plan: 1 gt cyclo in office, inserted amniotic membrane w/BSCL OS; continue Ab gt, report to safety dept



**Case #3 ctd**

RTC 2 days later, VA slightly worse; no FBS, pt feeling better  
 VA: OD 20/25, OS 20/40-, OU 20/20 (Q: what was VA reduced if K healing?)  
 SLE: lids clear, no injxn, mild central K stain, improved; no AC Rxn  
 Plan: removed amniotic membrane; continue Ab QID, report to safety dept

RTC 4 days later: K clear, D/C Ab, AT QID x 1 week; report to safety dept

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**Case #3: Is each visit considered a recordable?**

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**Case #4**

31 y/o WM presents with tired and sore eyes since yesterday, when he was welding for 10 hours at work. Minimal irritation after work, but pain level increased to an 8 out of 10 after bedtime. Pain 6/10 today.

Both eyes are equally irritated, he has used OTC AT, with no improvement. Pt was wearing his PPE while welding, pt thinks it was a reflection from a coworkers welding that caused the problem.



**Case #4**



Vase: OD 20/20, OS 20/20-  
 Ta: 22/20  
 SLE: lid edema/redness, tr conj injxn, + K edema, diffuse SPK, + AC Rxn  
 Impression: T36.10XA, burn of cornea and/or conj. sac  
 Plan: efx generic ketorolac for use QID OU x 2 days, then taper or D/C over 3 days; NP AT q2h for 5 days

Other treatment options???

- Steroid ung for adnexa
- Steroid gt for K edema
- Trop/Cyclo, if AC Rxn significant
- Oral narcotics
- Potato peels???

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**Case #4: Which of the following might be a reasonable treatment for flash burn?**

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**Case #5**

48 y/o WM, pt was hit in OS while trimming the grass at work 1 week ago; pt went to the ER that evening where he received numbing gt and was sent home; OS ++FBS, red, watering

Vase: OD 20/40+, CF @ 6' OS (NI PH); Ta: 39/14

SLE: 2+ conj injxn, +K edema, metallic KFB inf mid-periphery +NaFl staining, 3+ AC Rxn; Poor view of PP due to edema, but apparently irregular ONH/mac, pigment

Impression: T35.02XA (initial KFB)

Plan: 2 gt Prop OS, 1 gt Prop OD; Removed KFB w/spud, debrided area with Algerbrush; qgt cyclo, eRx Ab gt for use q2h while awake, BSCL inserted in office; RTC 1 day or PRN, gave pt emergency number; Send report to safety dept





**Case #5 ctd**

RTC: 1 day, compliant w/Ab gt qzh; OS still burning some, photophobia improved, BSCL in place; OS mid-dilated

Vase: OD 20/40+, CF @ 6' OS (NI PH); Ta: 21/20

SLE: 1+ conj injxn, NaFl staining at wound site, minimal edema, 1+ AC Rxn

PP: 90D reveals old scarring/trauma at ONH/macula; apparently stable

Impression: T15,02XD (subsequent KFB)

Plan: continue Ab gt QID OS until RTC 3 days. Send report to safety dept

RTC the following Monday, K clear, D/C Ab gt, NP AT QID OS x 1 week; RTC PRN; send report to safety dept

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**Case #5: Is it a recordable?**

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**In conclusion...**

After all of that, I hope you are each able to...

1. Recognize the importance of safety eyewear for both work and play
2. Understand and apply appropriate AOA @ ANSI optical standards
3. Be mindful of the difference between a recordable and non-recordable event
4. Properly chart and code safety/injury-related office visits



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**Audience Q&A Session**

Start presenting to display the audience questions on this slide.

**Thank you!**

**Any Questions?**

