

By Lawrence E. Heiskell, MD

Battlefield Ocular Injuries

Treating and protecting eyes for those on the beat and in the sand box.



Field treatment of eye injuries brings to mind the physicians admonition to "first, do no harm." Most eye injuries are best stabilized and treated in a proper medical facility.

The war in Iraq has clearly demonstrated that about 10 percent of all battle-related injuries to our troops are penetrating eye injuries from fragments of IEDs (improvised explosive devices), mortars and rockets. The majority of these battlefield ocular injuries are corneal foreign bodies, abrasions and eyelid lacerations. Other causes of eye injuries include chemical conjunctivitis from soldiers handling solvents and fuels. The daily threats include dirt, wind and allergens that are also prolific in the desert environment.

The LE tactical community is not exempt. Eye injuries can result from debris in an explosive breach, glass from breaking and raking a window and flying debris from the deployment of a flash bang. Tactical teams operating in Southern California know all too well the effect of the sun, dry wind and blowing sand.

What Gets Injured

The cornea is the transparent, dome-shaped skin covering the surface of the eye. Like the crystal on a watch, it provides us with a clear window to look through and this portion of eye is the most prone to injury. The cornea has no blood vessels and

is extremely sensitive. There are more nerve endings in the cornea than anywhere else in the body. The cornea is only about 0.5 millimeters thick. The outer layer of corneal epithelium is only about 5 to 6 cell layers thick and fortunately regenerates quickly when the cornea is injured superficially.

Unfortunately, penetration injuries into the cornea may leave a scar resulting in impaired vision. If the penetrating injury is even deeper, the object entering the eye can damage the iris, lens and even enter the center of the eye. This is a serious if not a catastrophic eye injury and may result in blindness or the loss of the eye.

The sole purpose of high-tech ballistic eye protection systems is to protect the eyes from penetrating trauma and not obstruct your field of vision.

Treatment

Superficial injuries caused by dirt or sand can be treated by flushing the eyes with running water. If this is unsuccessful, a closer examination will be necessary. Before this can be accomplished the victim will need a few drops of an ophthalmic topical anesthetic. This will allow the victim to cooperate with a visual exam of the eye. If you can visualize a foreign body and it appears superficial then an attempt to remove it with a cotton tip applicator is worth a try in the field.

If you are unsuccessful and you suspect a metallic foreign body embedded in

the cornea you will not be able to remove it without the use of a slit lamp (an adjustable lighted binocular magnifying instrument mounted on a table). This will require the patient to be transported to a clinic or hospital. At this point it is best to instill a few more anesthetic eye drops and prepare for extrication.


Deep-penetrating eye trauma is yet another story. All of these injuries will need evaluation by an ophthalmologist and it is best to cover the affected eye with a pair of goggles to prevent further injury and transport the patient to the nearest facility capable of surgically treating ocular injuries. If there is an object impaled in the eye or surrounding areas, do not remove it. Field removal may destroy otherwise salvageable tissue.

Eyewear Compliance

Obviously, comfort and field of vision is paramount for the user in selecting eye

THINGS TO LOOK FOR:

- Comfort and fit
- Shatterproof lenses
- Wrap-around coverage
- Distortion free
- Full UV protection
- Fog proof
- Scratch resistant
- Retention strap
- Clear and dark lenses
- Foam spacers to keep particles away from under the lenses
- Use an optical cleaning cloth to clean lenses

protection. These two features will determine the next factor, which is compliance. If the eyewear does not feel good on your face and does not give you excellent peripheral vision the user will not wear it. The lack of compliance obviously increases the risk of a serious eye injury. Most S.W.A.T. commanders are now aware of these issues and are enforcing compliance to reduce workman's comp claims. In the 1990s, the U.S. Army conducted a study and found that the reason why compliance was so poor among soldiers is that the goggles issued lacked soldier acceptance because of their appearance. They simply "didn't look cool". The bottom line is that you want eyewear that is comfortable, looks good and protects well. 

WILEY X HIGH VELOCITY PROTECTION

For the last 20 years, Wiley X Eyewear, of Livermore, CA has been one of the industry's leader in the research and development of protective eyewear to the military, LE and civilian markets. Wiley X has clearly set the benchmark of safety, style and utility in the industry, with all of its current models meeting or exceeding the ANSI Z87.1 - 2003 requirements for high-velocity impact standards. Many models meet or exceed the military VO ballistic impact specifications as well.

Wiley X lenses are crafted from "Selenite" polycarbonate, resulting in shatterproof, distortion-free vision and are treated with a resilient, scratch-resistant hard coat that protects the lens

from scratches and nicks. Nearly indestructible, the frames are as stylish as they are tough.

If that were not enough, they offer a wide selection of optical-quality lens

options, including LA (Light Adjusting), Sunburst Mirror, Polarized Smoke, Polarized Silver Flash and Blue Ice. The lenses block 100 percent of harmful UVA and UVB rays up to 400 nanometers and polarized versions are offered to provide superior glare reduction.

Every pair they make live up to the name they created HVP "High Velocity Protection." To learn more about the company's high-performance eyewear visit wileyx.com





