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), mortar 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 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 taking a window and flying debris from the deployment of a flash bang. Tactical teams operating in Southern California and the local mountain ranges are confronted with glass, flying debris, chemicals and solvent fumes generated from the use of solvents and fuels. 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, mortar and rockets.

### Battlefield Ocular Injuries

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

The cornea is the transparent, dome-shaped skin covering the surface of the eye. The cornea is the most sensitive tissue in the body and 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 injured. The cornea is injured superficially and will usually heal without treatment if it is not one of the more severe injuries.

**F** or the last 20 years, Wiley X Eyewear, of Livermore, CA has been one of the industry’s leaders 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. Wiley X lenses are crafted from “Borolite” 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.

**WILEY X HIGH VELOCITY PROTECTION**

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 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 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 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.