

## Workplace Eye Safety

Eye injuries at work are common. Every year approximately 70,000 workers injure their eyes. The Occupational Safety and Health Administration (OSHA) reports that nearly three out of every five injured workers were not wearing eye protection at the time of their accident. Luckily, 90% of all workplace eye injuries are preventable with the use of proper safety eyewear.

The Occupational Safety and Health Administration (OSHA) provides regulations that employers and employees must follow. The American National Standards Institute (ANSI) provides the following standards of eye protection for any workplace task:

- Unprotected workers will not knowingly be subjected to environmental hazards.
- Protective eyewear is required whenever there is a reasonable probability eye injury may occur.
- Employers must provide the type of eye protection best suited to the task to be performed.
- Employees are required to use the eye protectors provided.

The Bureau of Labor Statistics reports that eye injuries in the workplace cost over \$467 million annually. A written eye safety program should be implemented in the workplace to help prevent workplace eye injuries. Employers should consider these tips in developing their safety plan:

- Determine the potential for eye injury for the tasks performed by their employees.
- Decide how best to protect against the injury (e.g., dark lenses for welding, face-shield for flying objects, tight seal for chemical spills).
- Identify the visual needs of the job (e.g., magnification, dark lenses).
- Post rules regarding when and how eye protection must be used.
- Provide adequate and readily available supplies of eye protection at all times.
- Instruct employees on appropriate treatment if injury should occur.
- Require vision screening for new employees to diagnose any eye disease.

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## Subconjunctival Hemorrhage

A subconjunctival hemorrhage is similar to an ordinary bruise except that the bruise is to the eye. It usually appears as a single red spot or many red splotches spread out over the sclera, the white part of the eye.

Seeing a subconjunctival hemorrhage on the eye can be alarming, but it is quite common, it is usually harmless, and it will heal on its own. It will not affect your vision and usually will not cause pain.

The most common causes of this condition are sneezing, coughing, straining, or anything that raises the blood pressure in the veins, leading to a small rupture in a blood vessel or capillary. Other causes include rubbing the eye vigorously or trauma to the eye. Rare causes include blood clots or systemic blood disorders.

If the condition is recurrent or excessive, an ophthalmologist (Eye M.D.) may perform a medical workup, assess risk factors, and order laboratory studies.

Even though a subconjunctival hemorrhage can seem alarming, treatment is generally not necessary. The blood spot will slowly disappear on its own. If your eye is irritated, an ophthalmologist may recommend using over-the-counter artificial tears.

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## Paintball

Sports-related eye injuries are the leading cause of blindness in children. In recent years, the increasing popularity of paintball war games has led to many serious, vision-threatening injuries. These injuries are especially common in unorganized paintball activities, when no eye protection is worn. However, injuries often occur when participants remove protective eyewear during play in order to clean it.

Your ophthalmologist (Eye M.D.) urges you to use extreme caution if you or your children participate in paintball activities. Unfortunately, eyes that have been injured by paintballs have very poor recovery rates, and vision loss is very likely.

Visit an eye-care professional to have yourself or your child fitted with the appropriate protective eyewear before participating in a paintball game or using a paintball gun. Game participants should also be instructed to create a time-out rule by yelling “time out” or a similar agreed-upon phrase when they need to remove their protective eyewear for cleaning. Better yet, participants should not remove the protective eyewear until they are away from the area where paintball guns are being used and out of range of being hit.

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## Sports Eye Injuries

Every year, hospital emergency rooms treat nearly 40,000 victims of sports eye injuries. All professional and recreational athletes participating in eye-hazardous sports need to wear eye protection. To help prevent sports eye injuries, protective polycarbonate eyewear should be worn whether or not prescription eyewear is needed. All prescription eyewear used during sports should be made from polycarbonate.

The sports causing the most eye injuries are basketball, baseball, and racquet sports, but any sport where an object can fly toward the eye is considered hazardous. Unbreakable eyeglass frames, goggles, or facemasks are required when there is a potential for eye injury. Polycarbonate lenses have the highest impact resistance of any eyeglass material. They are 20 times stronger than ordinary eyeglass material, and while not unbreakable, they do afford the best protection available against eye injury from any high-velocity object.

Helmets with eye shields are recommended for football and other contact sports. Many sports, such as baseball, hockey, and men's lacrosse, require a helmet with polycarbonate face mask or wire shield, especially for very young athletes. Face guards can be worn over glasses and are used primarily for football, ice hockey, and similar high-risk sports. Some sports such as hockey have established standards for eye protection at the national level.

For high-speed sports such as skiing, wear special frames sturdy enough to protect the eyes from any impact. Wear ultraviolet-absorbing goggles or sunglasses while skiing to protect the eyes from glare, ultraviolet rays, and exposure to weather.

Boxing presents a high risk for eye injury. Unfortunately, there is no adequate protection available.

Contact lenses are not a form of protective eyewear. Contact lens wearers require additional protection when participating in sports, especially if the contacts are of the rigid type.

People with only one functional eye should carefully consider the risks of contact sports. Wearing adequate eye protection is imperative for people with sight in only one eye.

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## Traumatic Hyphema

Hyphema is the presence of blood in the front part of the eye. The condition is usually due to blunt trauma of the eye, in which case, it is called traumatic hyphema. Traumatic hyphema often occurs when the eye is struck by a ball, hockey puck, projectile toy, rock, BB gun pellet, bungee cord, paint ball, or a fist. The condition is very noticeable, as you can see blood behind the cornea. The blood may cover all or part of the iris, the colored part of your eye.

If your eye has been struck by an object or if you see blood in the eye, you should have a complete eye exam by an ophthalmologist (Eye M.D.) to rule out a more severe eye injury. Most patients receive treatment for traumatic hyphema on an outpatient basis. Your ophthalmologist will probably prescribe eyedrops to maintain dilation of the pupil, control inflammation, and reduce eye pressure if it is elevated. Your ophthalmologist may want to see you every day or two until your condition improves.

You must avoid doing any strenuous activity and taking aspirin; these may cause more bleeding, which could cause more severe damage and vision problems.

If you have had traumatic hyphema, you should see your ophthalmologist every year, because this injury increases your risk for angle-recession glaucoma, and early detection is critical to prevent vision loss.

It is important that you wear protective eyewear when engaging in activities that can be hazardous to your eyes, whether you are at work, doing chores around the house or yard, or playing sports.

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## Preventing Eye Injuries

Any activity where something might fly at the eye puts the eye at risk for an injury. Over one million people suffer eye injuries each year in the United States. Almost 50% of these accidents occur at home, and more than 90% of them could have been prevented.

Minor injuries to the cornea, the clear, protective covering over the front of the eye, can be quite painful. A corneal abrasion is a scratch to the cornea. Appropriate treatment may include an antibiotic eyedrop or ointment to prevent infection and an eye patch for comfort. Sand or other particles can stick to the cornea. Such foreign bodies may be removed with a moistened cotton swab, usually by a doctor. Do not rub the eye.

Regular prescription eyeglasses or contact lenses do not protect the eyes from injury. Some glasses and some types of contact lenses shatter if the eye is hit. People who play sports and wear prescription eyeglasses can have special safety glasses or prescription goggles made of high-impact polycarbonate plastic lenses and special unbreakable frames.

Unfortunately, many people do not think they are at risk for an eye injury until the injury occurs. The majority of eye injuries are easily prevented. Use common sense to reduce the risk of injuries, and be sure to follow safety precautions, including the following:

- Wear safety goggles when using powerful chemicals. Goggles should fit properly to prevent chemicals from getting under them yet still allow air to circulate between the eye and the lens.
- Polycarbonate sports goggles are recommended for all participants of high-impact sports or activities where there is a high risk of eye injury.
- Never use fireworks. Attend public fireworks displays instead of having fireworks at home. Amateur backyard displays are dangerous to the person lighting the fireworks, nearby family members, friends, neighbors, and pets.
- Supervise children when they are handling potentially dangerous objects, such as pencils, scissors, and penknives. Be aware that even common household items such as paper clips, elastic cords, wire coat hangers, rubber bands, and fishhooks can cause a serious eye injury.
- Avoid projectile toys such as darts and bows and arrows. Do not allow children to play with air-powered rifles, pellet guns, and BB guns. They are extremely dangerous and have been reclassified as firearms and removed from toy departments.
- Wear eye protection while mowing the lawn or using a “weed eater.” Stones and debris thrown from moving blades can cause severe eye injuries.
- Always check to make sure that a spray nozzle is pointed away from your face before using.
- Use grease shields to cover frying pans and protect eyes from splattering liquids.
- Wear snug-fitting, completely opaque eyeglasses or goggles to shield your eyes and block all UV light in tanning booths. Tanning facilities are required by the U.S. Food and Drug Administration (FDA) to provide safety goggles, but it is best to obtain your own pair so you will always be prepared. If you use the salon’s goggles, be sure that the salon personnel sterilize them after each

use to prevent infection and that the goggles are approved for this particular use.

- Read instructions and safety warnings carefully before using tools, chemicals, ammonia, cleaning supplies, and so on.
- Wear safety goggles and be sure you read the instructions carefully before jump-starting a car. Attach the negative ground of the dead battery last. This cable should be attached to the engine away from the dead battery terminal. *Never attach a cable to the negative terminal of the dead battery.*
- Never use a match or lighter to look under the hood of a car.

When an eye injury does occur, have an ophthalmologist (Eye M.D.) or other medical doctor examine the eye as soon as possible. Although the injury may not look or feel serious, it could cause serious damage to your eyes. If you have blurred vision, partial loss of vision, double vision, or sharp pains in your eye after an accident, see an ophthalmologist or go to a hospital emergency room right away.

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## First Aid for Eye Injuries

The most common type of eye injury that needs immediate action is a chemical burn. Alkaline materials (lye, plaster, cement, and ammonia) can cause severe damage and even blindness. Solvents, acids, and detergents also can be very harmful to the eye. Eyes should be flushed liberally with water if exposed to any of these agents.

If sterile solutions or eye washes are readily available, use them to flush the affected eye. If not, go to the nearest sink, shower, or hose and immediately begin washing the eye with large amounts of water. If the eye has come in contact with an alkaline agent, it is important to flush the eye for at least 10 minutes or more before even considering going to the doctor. Make sure water is getting under the upper and lower eyelids. After at least 10 minutes of flushing, transport the patient to the nearest emergency room.

Abrasions or scratches of the eyelids and cornea, the clear covering of the eye, occur frequently and can be quite uncomfortable. If the abrasion is dirty, gently cleanse the area with a stream of clean water.

Do not attempt to treat severe blunt trauma or penetrating injuries to the eye. Tape a paper or Styrofoam cup over the injured eye to protect it until proper care can be obtained. Try to avoid strenuous activity if such an injury has occurred and seek proper medical care immediately.

In the case of a blow to the eye, do not assume the injury is minor. The eye should be examined thoroughly by an ophthalmologist (Eye M.D.) because vision-threatening damage such as an intraocular bleed or a retinal detachment could be hidden.

First aid is only the first step for emergency treatment. If you experience pain, impaired vision, or any possibility of eye damage, call your ophthalmologist or go the emergency room immediately.

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## Champagne Corks

A flying champagne cork is an unguided missile capable of ruining anyone's party. Since they are small enough to pass by protective facial bones and can travel at high speeds, corks can be very dangerous projectiles and have been known to blind people by direct and severe trauma to an eye

It is important to handle bottles of champagne and other sparkling wines correctly and safely. Be sure the bottle is cold before opening it. The cork in a warm bottle is more likely to pop unexpectedly. Chilling the wine to 45° Fahrenheit also improves its taste.

After removing the cork's foil covering, carefully remove the wire hood while holding down the cork with the palm of your hand.

Point the bottle away from yourself and others. Place a towel over the top of the bottle and maintain a firm grip on the cork itself. Never try to dislodge the cork with just your thumbs. Tilt the bottle at a 45° angle, grasp the cork, and slowly and firmly twist it to break the seal.

Keeping the bottle at a 45° angle, hold it firmly with one hand and use the other hand to slowly turn the cork with a slight upward pull. Continue twisting until the cork is almost out of the neck of the bottle. Counter the force of the cork with a slight downward pressure just as the cork breaks free from the bottle. Now that the cork is safely out of the bottle, you can pour a glass and enjoy some champagne. Cheers!

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## Bungee Cords

Bungee cords are thick, elastic cords with metallic hooks on each end that are used for many purposes, but primarily to secure loads onto cars, bicycles, and other objects. Even when used correctly and with care, bungee cords are dangerous and cause many cases of vision-threatening blunt and penetrating trauma to the eye each year.

Bungee cords often accidentally release on one end while being secured, and the metal hooks have also been known to break off or bend straight enough to release from where they have been secured.

Your ophthalmologist (Eye M.D.) urges you to use extreme caution if you must use bungee cords, and to always use strong safety goggles or glasses every time you secure or release the cords.

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## Fireworks

Every year, fireworks rupture the eyeball, burn the eyes and face, cut the eyelids, and cause corneal abrasions in approximately 2,000 people in the United States alone. One-quarter of these eye injuries result in permanent loss of vision or blindness.

While all fireworks are dangerous, the single most dangerous kind is the small, explosive bottle rocket. Their erratic flight causes injuries to users and bystanders alike. Sparklers, often given to young children, burn at 1800° Fahrenheit, nearly hot enough to melt gold.

To avoid the dangers of fireworks, attend public fireworks displays instead of having fireworks at home. Amateur backyard displays are dangerous to the person lighting the fireworks as well as to nearby family members, friends, neighbors, and pets. Celebrate safely by letting the professionals put on the show.

At public fireworks displays, follow these safety tips to keep you and your family safe:

- Leave the lighting of fireworks to trained professionals—not only is it safer, it is also cheaper and more spectacular.
- Respect safety barriers set up to allow the pyrotechnicians (firework professionals) to do their jobs safely.
- For the best and safest view, stand at least 500 feet or up to a quarter of a mile away.
- Follow directives given by event staff and public safety personnel such as police and firefighters.
- If you find the remains of unexploded fireworks, do not touch them. Immediately contact the local fire or police department.
- Most important, never let your child play with fireworks. Ever.

If a fireworks injury to the eye does occur, do not touch the eye. Get medical attention immediately.

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## Intraocular Foreign Bodies and Sharp Trauma

If your eye has been cut or pierced by a sharp object like a knife, BB, or piece of metal, you should seek medical help immediately from your ophthalmologist (Eye M.D.) or at an emergency room. Beyond the damage your eye has already received, there may be pieces of the object somewhere in your eye. These are called intraocular foreign bodies.

Do not apply pressure to your eye with your hand or bandage. If possible, shield your eye by placing a paper cup over it to prevent further damage. If an object is protruding from your eye, it is best, if possible, to leave the object in your eye so that an ophthalmologist can determine how and when to best remove it.

Surgery is often required to repair the damage of an injury of this sort, and serious infections can develop that can quickly lead to vision loss. Advanced microsurgical techniques and new antibiotics have helped to improve the chances of saving eyes that are seriously injured in this way.

It is important that you wear protective eyewear when engaging in activities that can be hazardous to your eyes, whether you are at work, doing chores around the house or yard, or playing sports.

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## Jump-Starting Your Car

Every year, many people suffer severe eye injuries because they do not take proper precautions while jump-starting their car. A spark caused by hooking up the jumper cables can ignite fumes and cause the battery to explode. Battery acid and flying battery parts can strike your face and eyes and can blind you.

Here are a few simple precautions to avoid a serious injury:

- Wear protective goggles during all phases of the procedure. Keep a pair attached to your jumper cables.
- Put out cigarettes before opening the hood. Use a flashlight, not a match, to look under the hood at night.
- Be certain the vehicles that are being jumped are not in contact with each other.
- Do not allow the cable clamps to touch each other.
- Do not lean over the battery during the jump-starting process.
- Attach the positive (+) cable (red) to the positive terminal of the dead battery first. Then attach the other end of the positive cable to the good battery.
- Attach the negative (-) cable (black) to the negative terminal of the good battery. Then attach the other end of the negative cable to the engine block away from the negative terminal. *Do not attach a cable to the negative terminal of the dead battery.*
- Once the engine is started, carefully remove the cables in reverse order. Again, do not allow the clamps to touch.

If an injury does occur, contact your ophthalmologist (Eye M.D.) or go to the emergency room immediately.

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