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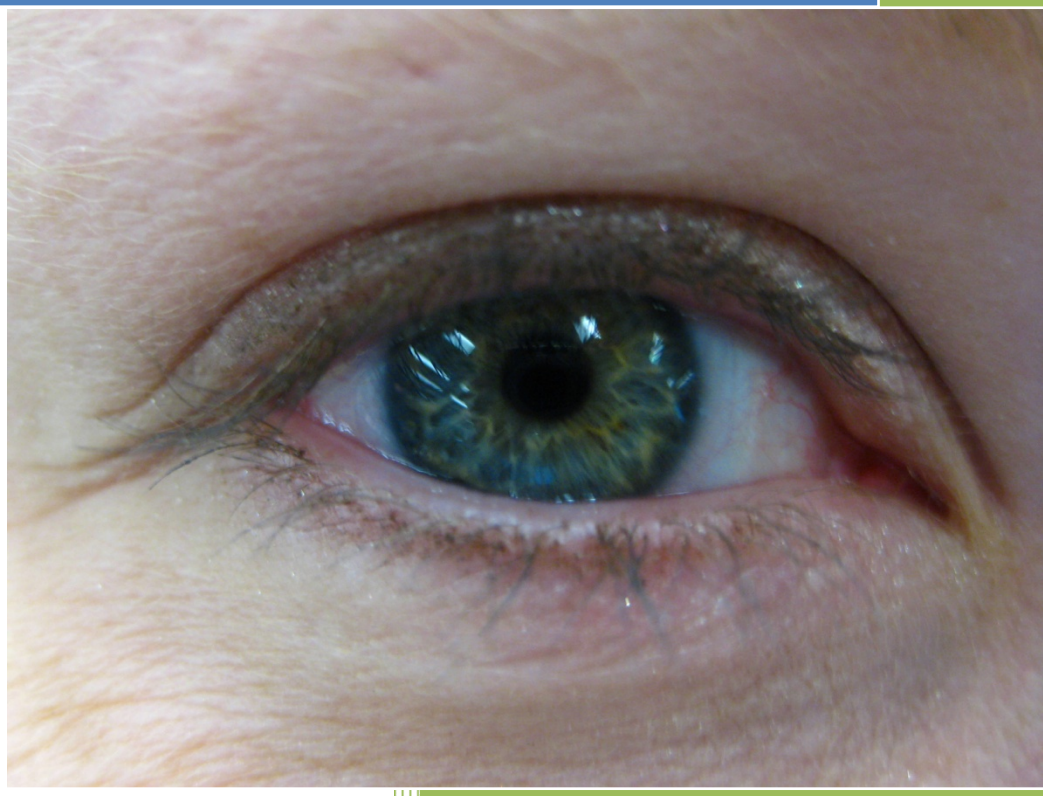
The Basics of Eye Protection



"A COMPLETE AND COMPREHENSIVE EYE PROTECTION PROGRAM REQUIRES THAT WE ADDRESS SEVERAL KEY ISSUES"

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The Basics of Eye Protection

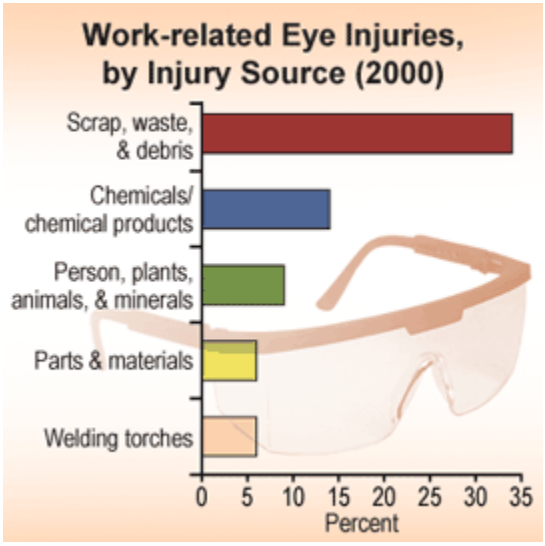
Each day more than 2,000 U.S. workers receive some form of medical treatment because of eye injuries sustained at work. More than 800,000 work-related eye injuries occur each year.

In 2000, 300,000 eye injuries were treated in U.S. hospital emergency departments (ED). This was 22.2 cases per 10,000 full-time workers. Of these workers, 80% were men. Compared with women, men had an eye injury rate 4 times higher (32.4 vs. 8.2 cases, respectively, per 10,000 full-time workers).

In 70% of cases, the injury was caused by contact with an object or equipment. In 26% of cases, the injury was caused by exposure to harmful substances or environments.

Injury sources were:

- *Scrap, waste, debris (34%)*
- *Chemicals or chemical products (14%)*
- *Person, plants, animals and minerals (9%)*
- *Parts and materials (6%)*
- *Welding torches (6%)*



The above information, taken from the CDC (Center for Disease Control and Prevention) at http://www.cdc.gov/features/dsworkPlaceEye/ gives us just a glimpse of the enormity of the problem that we are dealing with when we talk about eye protection.

Other statistics:

- 90% of eye injuries could have been avoided.
- The average time off work for an eye injury is 2 days
- Men make up over 80% of all eye injuries
- Across the U.S. there are 2000 eye injuries each day that require medical attention.

A complete and comprehensive approach to the problem requires that we look at the following issues…

1. What are the potential hazards that we are trying to protect against?
2. When and where are these hazards present?
3. How do we protect adequately against the various hazards?
4. What to do in case of eye injury.

1. What are the potential hazards that we are trying to protect against?

There are at least 6 different hazards that we are trying to protect against.

These are:

A. **Foreign Particles** – This can include dust, sawdust, metal shavings or any other particle that might come in contact with the eye.

B. **Chemicals** – This is most commonly splash protection but might also include airborne chemicals that may irritate or harm the eyes.

C. **Heat** – Extreme heat can be harmful to the eyeball and even lower amounts of heat, if not treated properly, can dehydrate the eye and cause damages.

D. **Light** – Light can affect the eyes in much the same manner as heat with the results not showing up until hours later. Lasers and welding are especially dangerous to the eyes and can results in a permanent burning of the retina.

E. **Blow or Impact** – Blows, bumps and trauma to the eyeball can result from impacts to the eye socket, even when the eye is closed.

F. **Cuts** – Lacerations to the eyeball can come from a variety of ways. In at least one instance, a piece of paper, falling out of a cabinet, caused a “paper cut” across a women’s retina that was severe enough to require surgery.

2. When and where are these hazards present?

Understanding when and where the hazards are present is crucial to an effective eye protection program. We cannot, realistically expect people to wear safety glasses, face shields or goggles all the time. Indeed, wearing safety eyewear when it is not required could present a danger all its own (Dark lenses that are proper protection for outdoor work, for example, are a hazard when worn indoors).

Identifying the "when" and "where" is also crucial in matching the right solution to the problem. For example, where chemical splash is a problem, safety glasses will not be adequate protection. If and when the nature of the hazard changes, the nature of the eye protection needs to change as well.

Identifying areas where there is a lot of flying debris and dust is, of course, the first step; knowing where welding flashes are present is important but many injuries also occur in less obvious places and these areas need to be identified as well.

What overhead issues might potentially cause eye injuries?
Is there debris and dust which, although not present at this time, might "float" in from one of the surrounding areas?
Are any of the following activities happening somewhere in the vicinity which might at some point affect the quality of the environment in the immediate area?

- Grinding
- Machine Operation
- Tooling
- Cutting
- Spraying
- Chipping
- Polishing
- Sand Blasting
- Welding

Are there any chemicals which might cause harmful vapors and fumes?
Is there any radiation, Ultraviolet, Infrared or laser work happening in any of the surrounding areas?

Once as many of the potential hazards as possible have been identified (others will probably show up at later dates, especially as procedural changes are made, machines are moved, machines added, etc…), then we can start to match the solution to avoid eye injuries. This is what we look at in the next step.

3. How do we protect adequately against the various hazards?

Simply slapping a pair of safety glasses on everyone isn't going to solve the problem. There are various types of eyewear protection for various issues.

Goggles, for example, are going to be more effective in an area with a lot of dust or very small particles. Safety glasses, even tight fitting ones, which are designed primarily to protect against the impact of flying debris, aren't going to protect effectively against airborne particles and dust.

If the issue we are protecting against has to do with welding flash, than we need to make sure that the eyewear we are providing is specifically designed to protect against it. We can't simply give the workers dark tinted glasses because it won't be enough protection.

There is a wide variety of options available:

Safety Glasses come in all sizes, styles and shapes. Wrap-around glasses provide a close fit that protects well. Other styles are flat lenses but have built-in side-shields.
Safety glasses come in a variety of tints. The main ones are as follows:

- **Clear** – For use in general purpose applications.
- **Amber** (also known as "Yellow") – These are most useful when fog, haze, overcast weather or snow have reduced sharpness and contrast. They provide clearer definition.
- **Vermillion** (also known as "Red") – The red tint absorbs green light. Can be used in place of the amber lens for sharpness and clarity.
- **Green/IR Shade** – These tints block red and infrared light. These are best when working in high heat applications like molten metal, furnaces, etc…
- **Gray/Silver Mirror/Blue Mirror** – Primarily used for outdoor applications these shades reduce glare and cut down on the amount of light that is allowed to reach the eye.
- **Indoor/Outdoor Mirror** – With a slight mirror sheen to them, this tint keeps the eye from dilating when outside so that visibility is not hampered when the wearer comes back inside. These are a great selection for anyone who has to go in and out a lot such as forklift drivers.
- **Polarized** – These glasses are designed to reduce glare by blocking reflected "horizontally polarized" light rays. Polarized glasses may not be suitable in areas where LCD displays need to be read, as they tend to block these as well, making the display hard if not impossible to read.

Goggles are available as a direct vent which allow air circulation and are therefore not appropriate for chemical protection, Indirect Vent which allow air to circulate somewhat but that still protect against liquids and unvented or ventless which are completely sealed and are ideal against chemical splash and fumes.

Face shields are designed primarily to protect more than just the eyes against impact. They cover the whole face. Because they are not air tight at all, however, they are not appropriate for protection against liquids and/or fumes and vapors.

It is important to make sure that your safety eyewear has the ANSI Z87.1 stamp to show that it has met the ANSI standard for safety.

Side Shields – For regular glasses that meet the ANSI Z87.1 standard, side shields are available to further protect against side impact. Note: Most regular prescription glasses do not meet the ANSI standard. For wearers of prescription glasses, there are Over-The-Glass safety glasses. Reader safety glasses are almost available for those who only need glasses for reading.

Additional Considerations:

- Make sure you get the right fit.
  People come in all sizes and shapes and this applies to the faces as well. Fortunately many of the safety glasses available on the market today have adjustable templates and arms to allow the wearer to get the correct fit. There are also smaller sizes available to ladies and custom bridges for people with less of a bridge on their nose. The object is to get the frames as close to the face as possible (without the eyelashes rubbing against the lenses) and supported properly by the nose bridge.
- Make sure that your glasses are clean
  Dirty or scratched lenses can hinder visibility. Keep the lenses clean using one of the many lens cleaning options available today. Replace scratched or pitted lens.

4. What to do in case of eye injury.

As hard as we may try to remove all hazards and protect ourselves, eye injuries can and will occur. Knowing what to do when the injury occurs is crucial. Often time is of the essence.

Treating a person who has something in his eye.

1. Do not rub the eye or allow the patient to rub his eye. Rubbing will further irritate.
2. Wash hands thoroughly with soap and water to remove any possibility of further contamination
3. Flush the eye using an approved eye wash
4. If you can see the object try to remove it with a clean, lint-free cloth. Pull the top eyelid over the bottom eyelid to try to use the bottom eyelashes to pull the item free.
5. If you cannot get the object out, seek immediate medical attention.

Treating a chemical Splash or other chemical exposure

1. If the injured person is wearing contact lenses, remove the lenses immediately to keep the lens from trapping the chemical in the eye.
2. Flush the eye for 15 minutes straight to dilute and remove the chemical from the eye.
3. Seek immediate medical attention and, if possible, bring the bottle or the MSDS sheet with you.

Treating cuts or punctures to the eye

1. Protect the eye and seek immediate medical attention. Keep the bandage from touching the eye using a eye cup or the cut out bottom of a paper cup.
2. Do not rinse, apply pressure or give the patient aspirin, ibuprofen or other anti-inflammatory drugs which might thin the blood and increase bleeding.

Treating a blow to the eye

1. Gently apply a cold wash cloth or compress to help reduce swelling. Do not apply pressure.
2. If the patient has blurred vision or other visual problem seek medical attention.

Treating light burns

1. Unlike other eye injuries, injuries related to lasers, welding and other radiant light sources may not be immediately detected. It may take several hours before the eye starts to feel irritated, as if there were sand in the eye. It may get severely bloodshot, or red, or it may swell. This may be as long as 12 hours after the exposure to the light. If this happens, cover the eye to avoid further irritation and get medical attention.

In any and all cases, you are better off getting professional medical help as soon as possible. Many eye injuries may not look that severe at first but could potentially result in permanent damage including permanent loss of vision.