



Sterile Emergency Eyewash Provides Unrivaled Worker Safety

With 126 million receptors in each retina, our eyes are the primary means of experiencing the world. There's simply no way to put a value on our vision and its impact on our day-to-day activities. Unfortunately, the eyes are also the body part most vulnerable to injury in the workplace. More than 2,000 eye injuries occur on the job every day, according to the U.S. Bureau of Labor Statistics. Almost 100,000 each year lead to temporary or permanent vision loss. The cost? The U.S. Department of Labor Statistics estimates more than \$300 million dollars annually, once factors such as medical expenses, lost production time and worker's compensation costs are tallied.

The best treatment for occupational eye injuries is, of course, prevention. Employee education, protective eyewear and safe manufacturing processes are essential in any at-risk setting. Still, accidents will happen. Immediate irrigation in the aftermath of an accident is a critical first step in treating workplace eye injuries to diminish overall damage to the eye.

Until recently, most eyewash stations employed either tap water (plumbed eyewash stations) or tap water with an additive (portable, tank-style stations). These flushing agents while good for many years were challenged by another option in the late '90s. The introduction of sealed-fluid cartridge systems using a purified buffered saline solution paved the way for the most advanced delivery system available to treat an eye injury. The solution, manufactured in a sealed filling process, offered a pre-mixed solution free from contaminants and common bacteria found in ordinary tap water. Until recently, the purified, sealed-fluid cartridge system was the most advanced option for emergency eye irrigation.

Advancements in eyewash technology have led to the development of sterile, sealed-fluid cartridges. A 100 percent sterile emergency eyewash delivery system is now available for emergency eye flushing needs. What's the difference between sterile and purified? Sterile solution is 100 percent devoid of anything living (i.e. microorganisms, bacteria etc.) that could further injure an already compromised eye. These cartridges are produced in clean-room environments that ensure sterility and negate the possibility of cross contamination.

Evolution of Emergency Eyewash Stations

To better understand the importance of a 100 percent sterile solution option, let's look at how emergency eyewash treatment in the workplace has developed.

Plumbed Eyewash Devices

When introduced more than 100 years ago, plumbed eyewash devices were the only choice in industrial settings to deliver emergency irrigation. While known today to deliver plentiful amounts of flushing liquid, there are a few drawbacks to be aware of with this choice of eyewash station. For the injured, flushing with tap water can be uncomfortable to tolerate for 15 consecutive minutes. Unless temperature is regulated, the water can be too cold or too hot, e.g., outside the range of 60° F and 100° F as outlined in the ANSI

guidelines. In addition, tap water is only as clean as the source that it is drawn from and may contain contaminants and bacteria that could further irritate or injure the eye and lead to infection. According to a study conducted by the Louisiana State University Health Sciences Center and the Kentucky Lions Eye Center, flushing with tap water can damage the eye's protective epithelial cell layer and further harm the corneal cells, because tap water's pH differs so much from that of the human eye. In addition, while tap water is fine for drinking, it may contain substances that can further harm an already damaged eye. For example, a survey of tap water by the Environmental Working Group, a nonprofit research organization, found 141 unregulated chemicals and an additional 119 for which the federal Environmental Protection Agency has set health-based limits. The chemicals found included arsenic, chloroform, copper and several others that can cause secondary injury and possible vision loss.

From the employer's standpoint, plumbed devices are expensive to maintain — ANSI requires that they be activated weekly — and impractical to move. Plumbed devices' stationary nature means that, to meet the easy-access requirements, any change in the workplace requires repositioning existing units or adding new ones to keep the eyewash station within 10 seconds of the potential hazard. Lack of portability makes it difficult to ensure that stations are close to the location of an eye injury.

Self-Contained Portable Devices

Portable, self-contained, tank-style devices introduced in the 1970s combat some but not all of plumbed devices' challenges. Besides the obvious advantage of portability to any worksite, these devices can dispense a mixture of tap water and an additive within the recommended tepid temperature range of 60° F and 100° F. The additives were introduced to help inhibit the growth of harmful microorganisms in the tap water.

Although they are designed to dispense a solution of tap water and an additive, their device components — filler caps, nozzles, basins, drains — can become contaminated with bacteria if not properly cleaned and maintained. In terms of logistics, it is often impossible to know whether a device is full without opening it. Further, ANSI standards require regular and frequent maintenance including cleaning, disinfecting and changing the flushing fluid (sometimes as often as every 3 to 6 months).

Sealed-Cartridge Devices

When these devices were introduced in the late 90s, they moved the technology a step beyond plumbed devices and self-contained portable devices. They offer all of the accessibility advantages of the portable devices, but often contain purified, buffered saline solution that matches the pH of the eye and remains free of bacteria or contamination for up to 24 months. Sealed cartridges require none of the time-consuming and costly maintenance of older systems, as their maintenance is once every two years, or after the unit is activated (weekly or monthly maintenance is not necessary).

But while the first generation of cartridge devices were a vast improvement over earlier flushing systems, these have been made even more effective by manufacturing 100percent sterile flushing solution!

Most Advanced, Effective Eyewash Units

The newest advancement in emergency eye irrigation is sealed-fluid cartridges that now deliver 100 percent sterile flushing solution from hermetically sealed nozzles and tubing that remain sealed and sterile until the eyewash station is activated. As with purified, buffered saline solution, sterile solution lasts for up to 24 months in sealed cartridges keeping maintenance costs to a minimum. In a significant step forward, the solution is prepared in an FDA-approved clean room to assure its sterile claim. The result is a solution that is buffered to the same pH as the human eye, which is especially important in the case of chemical splashes, when the eye's pH is disrupted. Because it utilizes a physiologically correct saline solution similar to human tears, it can be used for the full 15 minutes without irritating the eye — the pH remains stable during all stages of use, including storage and flushing.

Clearly, these new units offer crucial benefits to both employers and employees:

- The safety of the sterile solution is unmatched and offers significant advantages over tap water and even the first generation of sealed cartridges produced with purified water.
- The solution contains no living organisms that can further harm an already injured eye.
- The units offer the most protection from the contaminants and bacteria found in tap water that can cause secondary trauma.
- The sterile solution reduces the risk of potential liability, compared to flushing the eye with contaminated water.

When combined with proactive steps to reduce risks and increase compliance, sterile eyewash units allow what had recently been out of reach — the ultimate protection for the most common workplace injuries. The result is what all employees and employers want: increased productivity, lower healthcare costs, a safer work environment and, most important, unmatched care for the eyes — everyone's windows to the world.