PART ONE IN A SERIES

Splash safety—Protecting your eyes

Take the time to protect your eyes from pathogens.

EDITOR'S NOTE: March is Workplace Eye Wellness Month. In this first of a two-part series on protecting your eyes from splashed body fluids that may contain pathogens, we share insights from two experts: Amber Hogan Mitchell, DrPH, MPH, CPH, president and executive director of the International Safety Center; and Linda Powell, MSN, RN, FNP, workers' compensation case manager for Scripps Green/Scripps Encinitas in California.

How many nurses are exposed to splashes at work?

Mitchell: Nurses sustain the largest percentage of blood and body fluid exposures (BBFEs) in acute care settings in the United States. According to the International Safety Center's Exposure Prevention Information Network (EPINet®) national surveillance data from 2012 to 2016, nurses experience a disproportionate number of all splashes and splatters—about 50% (range of 47.7% to 54%) compared to all other healthcare professionals. Almost 60% occur in patient or exam rooms, and about 25% occur evenly distributed between emergency departments and operating rooms. Nurses report that 62.8% of all splashes touch unprotected skin.

From 50% to 60% of those exposures are blood or body fluids visibly contaminated with blood. An unacceptable number of these incidents occur to the nurse's face (83.4%); of those, 66.7% occur to their eyes.

Although we hear less about splashes than needlestick injuries, nurses experience slightly more splashes at the bedside in patient or exam rooms (the primary settings for needlesticks as well as splashes).

What are the dangers of splashes to the eyes?

Mitchell: Splashes to the eyes can result in transmission of bloodborne pathogens, bacteria, multidrug-resistant organisms, and other microorganisms. Dozens of pathogens, including HIV, hepatitis C virus (HCV), influenza, severe acute respiratory syndrome, herpes B virus, plague, rabies, and Ebola, have been documented to be transmitted via eye exposures. Few facilities do active surveillance for employees, so we can't estimate how many eye and mucus membrane exposures result in colonization or infection with multidrug-resistant organisms—and how many of these may result in cross-contamination or transmission to patients, coworkers, or family members.

One might argue that eye exposures are the riskiest exposure types, potentially resulting in not just pain and injury, but also infection or illness.

Powell: Eye splashes can have damage beyond bloodborne pathogen exposures. The pH of medications and body fluids can cause corneal trauma and corneal ulceration, resulting in the loss of use of one or both eyes. Viruses and bacteria—including adenovirus, herpes simplex, *Staphylococcus aureus*, and rhinoviruses—can be spread to the ocular mucus membrane by splashes, coughing, or touching the area with a contaminated hand or finger.

Do most nurses wear eye protection?

Mitchell: Unfortunately, no. Of those nurses reporting any kind of BBFE, only 8.1% said they were wearing eye protection. The percentage is even lower for exposures specific to the eyes: In 2016, only 1.7% reported they were wearing eye protection when the BBFE occurred, compared to 2012, when 7.3% said they were. Interestingly, in 2016, 62.8% reported BBFEs occurred in a patient or exam room, compared to 2012, when 44% were reported in the same location. This may mean that nurses are experiencing more exposures at the bedside and were wearing eye personal protective equipment (PPE) less frequently.

This trend has to be reversed and exposures must be reported and recorded so that they can be addressed and prevented. Organizations should consider incorporating eye and face protection not just into their infection prevention and control caddies, but also as a permanent fixture in patient rooms (either door or wall mounted).

What are the costs of splashes to the organization?

Mitchell: BBFEs are serious business and can have a

negative effect on an organization. The effect may be disproportionate in smaller facilities compared to larger ones because a single exposure in a small practice can result in not only disruption of patient care, but also compromised staffing, time away from work, employee turnover, and financial impact. In larger facilities, the organizational impact is different but also substantial (disruption of patient care, an immediate need to shuffle staffing, and costs associated with patient/source and employee baseline testing, postexposure follow-up, and potential prophylaxis).

Cost can range from $800 to $6,000 for a single exposure to $80,000 to $1,000,000 or more if an employee seroconverts to a bloodborne disease such as HCV and needs lifetime treatment. Additional costs can be accrued through workers' compensation insurance costs and premiums, not to mention potential Occupational Safety and Health Administration (OSHA) fines if an inspection occurs as a result of an employee complaint.

But the greatest expense is emotional. Because of the underlying stigma associated with occupational BBFE and reporting it, employees may not receive the medical care they need after an incident, which may increase their likelihood of becoming ill or seroconverting.

What are the standards regarding eyewear protection?

Mitchell: Although standards from the government and professional associations state the need for eye protection, they're not sufficiently healthcare focused.

The OSHA PPE Standard (29 CFR 1910.132) includes requirements for eye protection but is focused on physical hazards that may cause injury rather than illness or infection. OSHA's Bloodborne Pathogens Standard (29 CFR 1910.1030) leaves selection and placement of eye protection up to the employer, based on its exposure assessment. The standard states, "When there is occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns… *eye protection* [italics added]…." This is why tracking exposures is important, so that the circumstances surrounding them can be documented and appropriate PPE made available to employees.

The National Institute for Occupational Safety and Health states that "eye protection chosen for specific work situations depends upon the nature and extent of the hazard, the circumstances of exposure, other protective equipment used, and personal vision needs." The Association of periOperative Registered Nurses' standards on surgical attire include eye protection, and the American Optometric Association website provides guidance for workplace eye safety.

The lack of standard requirements for nurses' eye protection and the high prevalence of eye exposures compared to all other exposure types make it clear that we have work to do to convince policy makers, legislators, regulators, professional associations, and advocacy groups that we need to create or amend standards to protect nurses.

Powell: The Centers for Disease Control and Prevention recommends eye protection whenever staff may be at risk for acquiring infectious diseases through exposure to the ocular membrane.

When should nurses wear eye protection?

Powell: Eye protection should be used whenever exposure to body fluids or infectious viruses and bacteria *can* occur, not just when exposure is *likely* to occur. The rule of thumb is that if you put on gloves, put on eye protection.

Why don't nurses wear eye protection?

Powell: The two main reasons are lack of availability and failure to establish a habit of wearing it. Eye protection needs to be available at the point of service. If staff have to go outside of the patient room to obtain protection, odds are they won't do it. To encourage the habit of wearing eye protection, managers must set expectations and provide ongoing education about its importance. ★

In the second part of this series, Mitchell and Powell will focus on how organizations—and nurses—can reduce injuries from eye splashes.

This series is supported by an unrestricted educational grant from Tidi Products (tidiproducts.com).

When should you wear eye protection?

You should wear eye protection whenever you're working with blood and body fluids, including:

- when starting or discontinuing I.V.s
- when emptying indwelling catheters, bedpans, Hemovac drains, chest tubes, and Jackson-Pratt drains
- when irrigating indwelling catheters, percutaneous endoscopic gastrostomy (PEG) tubes, and nasogastric (NG) tubes
- when giving medications through PEG and NG tubes
- when working with constant irrigations of any type
- when in the operating room
- when drawing blood
- when working with patients on mechanical ventilation (suctioning, turning, transporting)
- when assisting with bronchoscopies
- during sanitary care
- during cardiac catheterizations
- during lumbar punctures.

Source: Linda Powell.

PART TWO IN A SERIES

Splash safety—Protecting your eyes

Learn how to reduce the risk and what to do if an injury occurs.

EDITOR'S NOTE: In this second of a two-part series on protecting your eyes from splashed body fluids that may contain pathogens, we share insights from two experts: Amber Hogan Mitchell, DrPH, MPH, CPH, president and executive director of the International Safety Center; and Linda Powell, MSN, RN, FNP, workers' compensation case manager for Scripps Green/Scripps Encinitas in California. Access the first article of this series at americannursetoday.com/?p=41195.

Why do organizations need to track incidents of splashes?

Mitchell: Preventing blood and body fluid exposures (BBFEs) depends on three key elements: surveillance, ongoing education, and adherence to a hierarchy of controls, such as personal protective equipment (PPE). The hierarchy of controls is implemented to provide inherently safer systems in healthcare. The controls at the top of the hierarchy are more effectively implemented at an institutional/organizational level. Although PPE sits at the bottom of the hierarchy, for BBFEs it's frequently the most effective form of control because exposures have an immediate impact to nurses while providing direct care.

Without surveillance, which includes robust exposure incident reporting and recording systems, an organization can't identify where the risks are, what's causing them, and what can be done to prevent them from recurring. All of this information is necessary to tailor education and adjust work practices.

Starting in July 2018, the Occupational Safety and Health Administration (OSHA) will require employers to submit their injury and illness records (OSHA 300, 300A) to the agency electronically, reflecting the government's focus on the importance of surveillance and exposure tracking as a way to identify risks that can be measured and controlled. Keeping thorough incident reports about splashes as they occur can help an organization improve its recordkeeping for other exposure types, such as needlestick injuries.

Powell: In addition to protecting employees, organizations need to know the financial implications of these incidents. We estimate that the cost of each incident is more than $1,000, which includes the cost of laboratory testing for patients and the employees, the patient's visit to the health clinic, and claim processing. Should the employee test positive for a bloodborne pathogen, costs escalate dramatically.

Mitchell: According to Exposure Prevention Information Network (EPINet®) data, the majority of expenses come from testing the patient and employee so that appropriate postexposure follow-up can be conducted. If there is a seropositive source, costs can skyrocket from the need for prolonged postexposure prophylaxis for conditions such as HIV.

How should organizations track BBFEs?

Mitchell: Just recording an exposure by collecting information on the date and location of the incident isn't enough. To build the best interventional programs, detailed information is needed so that targeted approaches can be developed to avoid recurrence. (See *Collecting the data*.)

For example, if an eye splash occurred in a patient room and the nurse wasn't wearing eye protection, this information could be used to assess whether eye protection was readily accessible in the area where it was needed or if it should be placed in a caddy on the door or wall of patients' rooms.

Collecting the data

The Exposure Prevention Information Network (EPINet®) is a freeware surveillance system developed in 1992 to help facilities collect the following information about blood and body fluid exposures (mucocutaneous):

- job category, occupational group, employment status (for example, employee, volunteer, student) of the person exposed
- where did the exposure incident occur (unit or department)
- was the source patient identified
- what body fluids were involved in the exposure
- what body part of the employee was affected by the exposure (for example, skin, eyes)
- what personal protective equipment was worn when the exposure incident occurred (for example, gloves, gowns, eye protection)
- what procedure or task was being performed during the exposure
- did exposure to a hazardous drug (for example, chemotherapy) occur during the incident
- how long and how much blood or body fluid was in contact with skin or mucous membranes
- a brief written description of the incident, if more information is needed.

With this kind of detail, the facility's leaders can adjust programs based on exposures experienced in their practice setting. For example, if an eye splash occurred in a patient or exam room and the nurse indicated not wearing eye protection, this information can be used to assess whether eye protection was readily accessible in the area where it was needed or if accommodations should be made to improve placement (for example, installing or adding eye shields to a wall or door caddy).

Other items can be added to make overall employee health surveillance and recording systems function in parallel; for instance, if the incident was Occupational Safety and Health Administration (OSHA) recordable (more than first aid was administered), if postexposure prophylaxis was given or prescribed, and if the incident was a result of a medical device failure. These elements can feed into OSHA recordkeeping, occupational safety and health, occupational medicine, and adverse event reporting to the Food and Drug Administration.

The 2018 EPINet Blood and Body Fluid Exposure Report form is available online at internationalsafetycenter.org/wp-content/uploads/2018/01/US-BBF-2018.pdf. Contact the International Safety Center if you're interested in becoming an EPINet user and receiving the surveillance database or becoming a part of their reporting network (internationalsafetycenter.org/use-epinet/).

What techniques did you find to be effective in implementing eye protection?

Powell: We realized that although hanging the eye shields on the wall would encourage their use, we needed to take other actions to change staff habits. Much like the introduction of other PPE, the effort had to be ongoing and persistent. We also knew that we needed manager buy-in and staff involvement, and that any change had to be time- and cost-effective. Helpful strategies included the following:

- We put eye shield containers on the wall next to the glove containers and encouraged staff to pull gloves and eye shields at the same time.
- We worked with managers to create a list of situations when staff were expected to use eye protection. We turned the list into a colorful flyer and posted it in each unit's dirty utility room.
- We coordinated between unit managers and supply chain staff to set a go-live date and to establish resupply levels for each unit.
- Before going live, we sent an email to all clinical staff describing the shields, where they would be placed, when to use them, and how the containers would be refilled.
- Managers discussed eye shields at shift huddles, reviewing when and how to use them and how to refill containers. Performance expectations were relayed to all staff.
- Initial education included 3- to 4-minute roving staff development sessions, literally catching staff members as they entered and left patients' rooms. These sessions were scheduled for different days and shifts to reach as many clinical staff as possible.

What kind of ongoing follow-up do you continue to do to ensure compliance with eye protection?

Powell: During ongoing, quick (about 5 minutes) biweekly safety rounds, the director of wellness and the facility safety champion check if eye shield containers are properly filled and note units where multiple containers are found empty. The good news about empty containers is that the shields are being used; the bad news is that they aren't available for the next staff member. The facility champion discusses challenges with managers and assists in overcoming them. Emphasis is placed on changing staff habits, rather than punitive criticism.

What should be done when an eye splash occurs?

Powell: When an exposure occurs, employees should irrigate the eye with clean water, saline, or sterile irrigant, report the incident to their supervisor, and seek medical evaluation. At our organization, the affected employee also notifies our workers' compensation carrier. An injury report is generated, and the workers' compensation case manager contacts the employee immediately. The case manager asks the employee why and how the exposure occurred and encourages him or her to troubleshoot the incident by asking how it

The goal is *reducing injuries*, not assigning blame.

could have been prevented, including how wearing eye protection could have avoided the exposure. This discussion helps identity any larger issues; for example, in one case, we learned that defective equipment contributed to the splash exposure. We also recruit the staff member as a champion in the prevention of future incidents.

Care is arranged at our employee health clinic. To close the circle, the manager discusses the incident with the employee, completes an injury review form that details how the incident could have been prevented, and develops an action plan for preventing future incidents. The action plan may include individual education and increased discussion about prevention during staff huddles.

How else should the organization follow up?

Powell: We discuss all exposure incidents during a monthly multidisciplinary injury review meeting. Monthly reports provide the number of exposures and where they occurred. The goal is reduction of injuries, not assignment of blame. For example, managers from units that have more exposures can troubleshoot with managers who have fewer. We have found the review to be very effective.

The workers' compensation case manager monitors staff members who have more than one exposure and staff members who are not wearing eye protection. Managers are notified if additional follow-up is needed.

Mitchell: The only way to know if occupational health and safety and risk-mitigation efforts are successful is to measure how they impact employees over time. Capturing as much important information about an exposure incident as possible (and appropriate) serves to reassure employees that the organization is doing as much as it can to put controls, education, and training in place to protect them today, tomorrow, and well into the future.

Have you seen a reduction in exposures as a result of your efforts?

Powell: Changing habits takes time, so we measure the number of preventable incidents on a quarterly basis. We immediately saw a decrease in exposures, and our goal is to have a greater reduction within two calendar years. ★

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