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Organization Leadership

By Mary Bliss, RN, COHN
Executive President

Passionate about Occupational Health and AOHP

The specialty of occupational health nursing in the United States has been continually evolving since the first industrial nurse was hired by a Pennsylvania coal mining company in 1888. Our dedication to the health, safety and well-being of workers has made a profound impact on our organizations and communities for nearly 130 years. The responsibility we carry is great, as are the rewards. It comes as no surprise to recognize that occupational health professionals - including me - are passionate about the work we do every day!

I’ve been an occupational health professional for 20 years (and a nurse much longer than that)! I believe we never grow too old to learn new things. In our profession, however, the knowledge we must gain to become effective leaders can’t typically be found within the confines of our hospitals. We need to establish connections outside our individual work environments where we can find the mentorship, networking and education that promote best practices in occupational health. AOHP is the best professional resource we have, with a wealth of information to help us understand and apply the highest standards of employee health and wellness in our organizations.

The knowledge I have gained from being an active member of AOHP has given me confidence in my decision-making and empowered me to advocate for changes in my hospital that ultimately make our workforce, patients and communities healthier. AOHP has encouraged me to become more visible in my role. I’m not afraid to put myself out there because I know my worth and the value high quality occupational health brings to my employer.

Occupational health professionals are asked to wear many hats. We serve as managers, clinicians, case managers, educators, consultants and researchers. We need to adhere to professional and ethical standards of practice, as well as legal requirements, in advocating for the health and safety of workers at all levels of our organizations. We often work independently, but also collaborate with professionals across many disciplines to address complex issues. We must maintain current knowledge through evidence-based practice and research.

Occupational health is a specialty of which much is required. We are busy, and we face many challenges on a daily basis. Our practice is unique and deserves a dedicated organization like AOHP to help us succeed as individuals while advancing respect and credibility for our profession.

AOHP is the defining resource and leading advocate for occupational health in healthcare, and the only national professional association dedicated exclusively to addressing the needs and concerns of occupational health professionals who work in healthcare settings. AOHP supports members across the nation and around the world through:

- Advocating for healthcare worker health and safety.
- Professional growth and development, including education and networking opportunities.
- Health and safety advancement through best practice and research.
- Building collaborative relationships with organizations that support the advancement of occupational health practice.

Other benefits your AOHP membership provides are:

- AOHP Listserv
- Annual National Conference
- Continuing Education
- AOHP peer-reviewed quarterly Journal
- Quarterly E-Newsletter
- Networking at local, regional and national levels
- Local chapters in five regions, providing support close to home
- Monthly E-Bytes
- Legislative Advocacy and Updates
- Access to Position Statements and Standards of Practice
- Strategic Partnerships with OSHA, NIOSH, TJC and others
- Discounts on Publications, including the renowned Getting Started Manual
- Scholarship Opportunities

Each of us has the power to make a difference in the world. And AOHP provides every member with greater opportunities to affect positive changes through our work. Are you taking advantage of all the benefits AOHP has to offer? Are you ready to take the next step and become more involved with AOHP at the regional or national level? Would you consider inviting a colleague to join AOHP?

It’s an exciting time to be an occupational health professional. It’s an exciting time to be an active member of AOHP. And I am excited and honored to now be serving as your Executive President as we plan for the future while we accomplish goals together today.
Staying Current on Government Affairs

By Stephen A. Burt, MFA, BS
Government Affairs Committee Chair

Editor’s Note: This issue of the Journal is pleased to introduce new columns featuring the expertise of two outstanding AOHP professionals. Steve Burt shares his insight in this column on government affairs. Welcome, Steve! We are happy to have you and thrilled to learn from you.

Going Up? OSHA Penalties Likely to Rise

On November 3, 2015, President Obama signed the Bipartisan Budget Act of 2015 into law. The Budget Act was negotiated quickly by a small group of Republicans and the White House to avoid a default on the national debt. Perhaps as a result of this quick and secretive action, it includes a surprise for those with an interest in occupational safety and health: penalties imposed by the Occupational Safety and Health Administration (OSHA) will be increasing. Title VII of the Budget Act — the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 — requires mandatory upward adjustments of multiple civil penalties, including those proposed by OSHA. To date, OSHA’s monetary penalties have not been subject to inflationary increases and, in fact, have not been adjusted since 1990. Now signed into law, OSHA will be required to adjust its penalties annually based on the Consumer Price Index (CPI). Beginning in January 2017, annual updates to civil penalties will be published each year by January 15 in the Federal Register. It is important to note that these adjustments will not require rulemaking.

By no later than July 1, 2016, OSHA must implement a “catch-up adjustment” to its penalties by issuing an interim final rule. Prior to issuing the interim final rule, OSHA is not required to follow the normal notice-and-comment rulemaking provisions. The changes to the penalty amounts depend upon the cost-of-living adjustments (COLA) established by the Consumer Price Index (CPI). The initial catch-up adjustment amount will be the percentage difference between the CPI in October 2015 and the CPI in October 1990, which was the year that OSHA penalties were last adjusted. The percentage difference between the CPI in September 2015 and October 1990 is approximately 78 percent. Using that figure, OSHA’s penalties would change roughly as shown on the chart below.

NOTE: These numbers are approximate because the October 2015 CPI data is not completed. The initial penalty increases must become effective by August 1, 2016.

OSHA may seek to impose a smaller initial penalty increase than what is called for under these formulas by:

1) publishing a notice of proposed rulemaking requesting comments regarding the penalties;

2) concluding, based on the comments, that an increased penalty will have a “negative economic impact” or impose “social costs” that outweigh the benefits of increasing the penalties; and

3) obtaining the approval of the Director of the Office of Management and Budget.

After the initial catch-up adjustment is made by July 1, 2016, OSHA is required to adjust penalties no later than January 15 of each year using the CPI. As such, employers should expect to see OSHA penalties increase annually with inflation.

Employers have typically looked at a variety of factors in determining whether or not to appeal citations issued by OSHA, including the risk of future “repeat” or “willful” citations, the steps necessary to abate the alleged hazard, and customer and employee relations issues. The penalty often has not been a significant factor in determining whether or not to contest. Given these increases, that may change.

<table>
<thead>
<tr>
<th>TYPE OF VIOLATION</th>
<th>NEW PENALTY AFTER COLA ADJUSTMENT</th>
</tr>
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<tbody>
<tr>
<td>Other-than-Serious Violation</td>
<td>Maximum of approximately $12,476 (The current maximum is $7,000)</td>
</tr>
<tr>
<td>Serious Violation</td>
<td>Maximum of approximately $12,476 (The current maximum is $7,000)</td>
</tr>
<tr>
<td>Repeat Violation</td>
<td>Maximum of approximately $124,765 (The current maximum is $70,000)</td>
</tr>
<tr>
<td>Willful Violation</td>
<td>Minimum of approximately $8,912; maximum of approximately $124,765</td>
</tr>
<tr>
<td></td>
<td>(The current minimum is $5,000; the current maximum is $70,000)</td>
</tr>
<tr>
<td>Failure-to-Abate</td>
<td>Maximum of approximately $12,476 per day (The current maximum is $7,000)</td>
</tr>
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</table>
Changes and Challenges

This fall issue of the Journal features both changes in our Journal format and discussions of challenges in our practice.

Cindy Brumley is making her farewell appearance as she retires her Advances in Technology column. Cindy has provided us a great deal of helpful information related to various issues in technology, and we are sorry to lose her expertise due to her increased employment responsibilities. Cindy, we understand choices have to be made, and priorities of time are difficult decisions. We wish you the best and thank you for your many excellent columns!

As Cindy was finishing the draft of her final column, while we were in San Francisco at the AOHP National Conference, I approached Cory Worden about writing a regular column for our Journal on healthcare safety. When Cory quickly said, “I’ll do anything I can to help,” I felt like I had won the lottery. Cory is a skilled safety professional and has written multiple articles on various healthcare safety topics. His safety program at his facility is first rate, and he has won various safety awards. Welcome to the Journal as a regular feature columnist, Cory!

On the heels of my success in securing Cory to pen a regular column, I called upon Steve Burt shortly after our return from San Francisco and appealed to him to write a regular column on government affairs. Many of you know Steve as a frequent speaker at our national conferences, as well as an author of both Journal articles and shorter informational pieces for our newsletters. When Steve agreed, I knew I was on a roll! Our Journal will greatly benefit from Steve’s consistent insight.

This issue of our Journal reflects on some of the many challenges we frequently face in occupational health. A fellow employee prompted me to share the CDC’s information on Methicillin-resistant Staphylococcus aureus (MRSA). MRSA is well known but often misunderstood among hospital staff. Often called “Mersa” or “Mercy” by staff in my hospital (maybe it is a southern thing??), MRSA is very feared but not always respected. I think staff should be reminded of the basic information on MRSA on a regular basis, so we take the opportunity to educate any staff we see with wounds, skin irritations, etc. I recently worked with returning a staff RN on a medical unit to work after a severe MRSA infection. It started as a small “pinpoint red bump” on her breast that she expressed, and it turned into a massive MRSA infection that required hospitalization, surgery for I&D, several rounds of antibiotics and many weeks off work and daily packing of an open wound.

Two articles written specifically for our Journal address other frequent occupational health challenges - blood exposures and hazard communication.

I hope you find the new Journal additions and articles in this issue helpful to meeting the challenges of your practice.
AOHP Recognized as Clinician Outreach and Communication Activity Partner

On July 1, 2015, AOHP was informed by Loretta Jackson Brown, PhD, RN that AOHP would be featured as the CDC’s Clinician Outreach and Communication Activity (COCA) Partner Spotlight for July. COCA’s goal is to prepare clinicians to respond to emerging health threats and public health emergencies by communicating relevant, timely information related to disease outbreaks, disasters, terrorism events and other health alerts. The communication from the CDC included that the “CDC’s partnership with AOHP is vital to our ability to communicate with occupational health professionals, and provide them with information on public health emergencies, CDC guidance, health alert messages and training opportunities. We value our longstanding relationship with AOHP and look forward to strengthening our partnership as we continue to work toward a common goal of improving national health security.” It is an honor for AOHP to be recognized as an important partner with COCA regarding emerging public health threats.

OSHA Updates

OSHA Healthcare Enforcement Activities

In two recent decisions, the Occupational Safety and Health Administration (OSHA) has cited health-care organizations for failing to protect employees from workplace violence. In June, the Occupational Safety and Health Review Commission affirmed that a Florida healthcare service company failed to protect its worker from violence in the workplace, which ultimately led to the worker’s death. A healthcare coordinator with Integra Health Management was fatally stabbed by a client in 2012. The firm was aware of the client’s violent criminal history but failed to develop and implement safety practices to protect the employee.

In a second case, OSHA inspected a therapeutic treatment center run by Gateway, a social services organization in Birmingham, AL, in response to a complaint alleging workplace violence. OSHA issued one general duty clause citation after finding that the employer failed to protect workers from the hazards of physical assault while providing care for adolescent children and teenagers known to exhibit violent behavior tendencies. Workers suffered injuries such as bites, abrasions, contusions and stab wounds. “During our investigation, it became clear that management was well aware that its employees were being injured by violent clients for several years, yet they took no action to protect their workers,” said Ramona Morris, OSHA’s Director of the Birmingham Area Office. Proposed penalties are $7,000.

On June 25, OSHA added workplace violence, along with musculoskeletal disorders, bloodborne pathogens, tuberculosis, and slips, trips and falls, as key hazards that will be focused on in future OSHA investigations in the healthcare industry.

Employees at a Cincinnati nursing care facility will benefit from improvements the company is making to its policies and procedures for transferring residents at Twin Towers, a provider of skilled nursing care services. Under terms of a settlement agreement with OSHA, Twin Towers will retain a specialized safety consultant with ergonomics expertise to recommend improvements to its resident handling program that will include: minimal lifting by caregivers; using safe handling technologies such as mechanical lifts; repositioning aids; and training for workers. The company will report to OSHA on improvements to its program within six months and pay a penalty of $18,200 to resolve OSHA citations issued in June. The agency issued citations after conducting an inspection based on a review of injury and illness logs for employees, which indicated a high rate of musculoskeletal injuries for caregivers.

OSHA Directive Updates Procedures for Protecting Workers from TB

OSHA has updated instructions for conducting inspections and issuing citations related to worker exposures to tuberculosis (TB) in healthcare settings. OSHA’s updated instructions incorporate guidance from the Centers for Disease Control and Prevention. The revised directive does not create any additional enforcement burdens for employers; it simply updates OSHA’s inspection procedures with the most currently available public health guidance. This directive also covers additional workplaces regarded as healthcare settings, such as sites where emergency medical services are provided and laboratories handling clinical specimens that may contain TB.

Updated Guide to OSHA Training Requirements Now Available

OSHA has posted a fully updated version of its guide to all agency training requirements to help employers, safety and health professionals, training directors and others comply with the law and keep workers safe. Training Requirements in OSHA Standards organizes the training requirements into five categories: General Industry, Maritime, Construction, Agriculture and Federal Employee Programs. The document is approximately 270 pages, and about one third of the document is dedicated to general industry training topics, a number of...
which are related to healthcare. A few examples include respiratory protection, hazard communication and personal protective equipment. To access the training document, go to https://www.osha.gov/Publications/osha2254.pdf. The safety and health training requirements in OSHA standards have prevented countless workplace tragedies by ensuring that workers have the required skills and knowledge to safely do their work. These requirements reflect OSHA’s belief that training is an essential part of every employer’s safety and health program for protecting workers from injuries and illnesses.

**OSHA Provides Guidance for Enforcing the Revised Hazard Communication Standard**

OSHA has issued instructions to compliance safety and health officers on how to ensure consistent enforcement of the revised Hazard Communication standard. This instruction outlines the revisions to the standard, such as the revised hazard classification of chemicals, standardizing label elements for containers of hazardous chemicals, and specifying the format and required content for safety data sheets. It explains how the revised standard is to be enforced during its transition period and after the standard is fully implemented on June 1, 2016.

OSHA revised the standard in March 2012 to align with the United Nations Globally Harmonized System of Classification and Labeling of Chemicals. The revised standard improves the quality, consistency and clarity of chemical hazard information that workers receive.

Under the standard, employers were required to train workers on the new label elements and safety data sheets by December 1, 2013. Chemical manufacturers, importers and distributors had to comply with revised safety data sheet requirements by June 1, 2015. Manufacturers and importers had to comply with new labeling provisions by June 1, 2015. Distributors have until December 1, 2015, to comply with labeling provisions as long as they are not relabeling materials or creating safety data sheets, in which case they must have complied with the June 1 deadline.

Additional information on the revised Hazard Communication Standard may be found on OSHA’s Hazard Communication Safety and Health Topics page at https://www.osha.gov/dsg/hazcom/index.html.

**New Resource: Infosheet on Contaminated Water in Eyewash Stations**

OSHA has updated a resource to help employers understand how important it is to flush emergency eyewashes to prevent organisms from growing in the stagnant water. Eyewash stations are critical emergency safety equipment intended to lessen the severity of eye injuries from workplace exposure to irritants or biological agents. The Health Effects from Contaminated Water in Eyewash Stations Infosheet provides information about the organisms that can grow in stagnant water, how to prevent them from growing, and how to recognize infection signs and symptoms. The Infosheet can be found at https://www.osha.gov/Publications/OSHA3818.pdf.

**OSHA Announces New Weighted Inspection System**

OSHA has moved to a new enforcement weighting system that assigns greater value to complex inspections that require more time and resources. The new system will allow for more strategic planning and measurement of inspections, and will ensure that all workers are equally protected, regardless of the industries in which they work. The system assigns “Enforcement Units” to each inspection. Routine inspections count as one unit, while those requiring greater resources — such as those involving musculoskeletal disorders, chemical exposures, workplace violence and process safety management violations — count as up to nine units. The values are based on historical data and will be monitored and adjusted as necessary.

OSHA Assistant Secretary Dr. David Michaels announced the change at the 2015 National Safety Council conference in Atlanta. "All inspections aren’t equal — some are complex and require more time and resources — and many of those inspections have the greatest impact," he said. "This new system will help us better focus our resources on more meaningful inspections." Inspections are one of the fundamental tools OSHA uses to encourage employers to abate hazards. Strong evidence from several recent studies shows that injury rates decrease at an establishment in the years following an OSHA inspection.

**OSHA Mobile-friendly e-Books**

Select OSHA publications are available in e-Book format. OSHA e-Books are designed to increase readability on smartphones, tablets and other mobile devices. Available at www.osha.gov/ebooks, the e-Books are in English and other languages and are easily accessible to reach key groups of workers and employers.

**NIOSH Updates**

**NIOSH, VA Collaborate on Safe Patient Handling Project**

The National Institute for Occupational Safety and Health (NIOSH) and the U.S. Department of Veteran Affairs (VA) are collaborating on a study of best practices for safely lifting and moving patients, particularly obese patients. At five VA hospitals, researchers are collecting hospital records data and worker surveys to examine: musculoskeletal hazards in patient handling; safety program factors such as policies, training and equipment; and related outcomes such as caregivers’ perceived exertion, discomfort and injuries. Researchers estimate that it will be at least 2017 before results of the extensive project begin to become available.

**NIOSH Study Finds Measures Lacking for Compounding Antineoplastic Drugs**

A new NIOSH research article found that recommended safe handling practices for compounding antineoplastic (chemotherapy) drugs are not always followed in healthcare settings. This study was published in the September issue of the Journal of Occupational and Environmental Hygiene and is available online. This paper presents findings on current engineer-
ing and administrative control practices, personal protective equipment (PPE), and barriers to using recommended PPE for nurses, pharmacists and pharmacy technicians as they prepare antineoplastic drugs.

Newly Re-named NIOSH Respiratory Health Division (RHD)

On September 22, the NIOSH Division of Respiratory Disease Studies (DRDS) officially became the NIOSH Respiratory Health Division (RHD). The DRDS name originated in 1976, when operations based in the NIOSH-Morgantown facility were reorganized. The DRDS name reflected its focus at that time on studying how respiratory hazards such as coal, silica, asbestos and endotoxin caused occupational respiratory disease. Over the next 40 years, DRDS studied these and many other respiratory hazards. DRDS also provided important public health services, including the Coal Workers’ Health Surveillance Program, Health Hazard Evaluations primarily focused on respiratory issues, and the Spirometry Course Certification Program. RHD will always retain at its core the DRDS mission of protecting workers from diseases caused by respiratory hazards. But the new RHD name also reflects its public health service mission and NIOSH’s desire to do more than just prevent disease. NIOSH’s vision is to optimize health, enabling the people we serve to enjoy their lives to the fullest.

NIOSH Ladder Safety App Expands

Since its release in 2013, the National Institute for Occupational Safety and Health’s (NIOSH) Ladder Safety app has helped thousands of users set up and use extension ladders more safely to prevent falls. NIOSH recently announced that the app will now include stepladders.

The new stepladder module will be available at the end of this year to help workers use the most common four-legged portable ladders more safely. The new module will be based on the existing ladder safety standards and regulations and will provide easy-to-use, graphic-oriented safety tools, checklists and guidelines.

With more than 40,000 downloads in the past two years, the NIOSH Ladder Safety app continues to help improve the safety of workers using extension ladders. In addition to its ladder-positioning tool for setting the ladder at the optimal angle, the app contains general ladder safety, inspection and selection guidelines, and related information. The Ladder Safety app is available free, in English or Spanish, for Apple and Android smartphones. Read more on NIOSH’s webpage on Fall Injuries Prevention in the Workplace at http://www.cdc.gov/niosh/topics/falls/pubs.html.

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Advances in Technology

By Cindy Brumley, RN

I often tend to focus on what technology is available to improve my workplace efficiency. Seldom do I think about providers who struggle in countries with extreme poverty. In this article, I present future disruptive innovations that have piqued my interest – and hopefully, yours. The first technology involves inexpensive diagnostic testing. The second deals with vaccinations. The third highlights point-of-care testing for tuberculosis.

mChip

Samuel Sia, Associate Professor of Biomedical Engineering at Columbia, and his team of researchers have been working the past decade to develop mChip, a technology that can bring inexpensive point-of-care blood testing to globally remote areas. In this case, it is for three infectious disease markers (although it can do other diagnostic tests), HIV and syphilis (two markers). Sia adds, “By increasing detection of syphilis infections, we might be able to reduce deaths by 10-fold. And, for large-scale screening where the dongle’s high sensitivity with few false negatives is critical, we might be able to scale up HIV testing at the community level with immediate antiretroviral therapy that could nearly stop HIV transmissions and approach elimination of this devastating disease.”

A smartphone dongle (an attached or wireless piece of hardware that enables an electronic device to have additional function) replicates the objective enzyme-link immunosorbent assay, or ELISA, testing at a fraction of typical resources. Sia estimates the dongle will have a manufacturing cost of $34, much lower than the $18,450 that typical ELISA equipment costs. The microfluid card holding the blood sample is approximately the size of a credit card and costs pennies to make. The time required to process is 15 minutes instead of days. Instead of necessitating specialty-trained lab personnel, this technology requires little user training. It needs no maintenance, is highly portable and has low energy consumption since all of the power is drawn from the smartphone.

Set up in prevention-of-mother-to-child-transmission clinics or voluntary counseling and testing centers in Rwanda, the mChip was piloted by healthcare workers who were given 30 minutes of training. User-friendly interfaces aided the user through each test, with step-by-step pictorial directions and built-in timers to alert the user to next steps and recorded test results for later review. The vast majority of patients said they would recommend the dongle (this technology) because of its fast turn-around time, ability to offer results for multiple diseases, and simplicity of procedure. Also notable is that transportation issues are eliminated since this is truly point-of-care testing. Sia’s vision - “This kind of capability can transform how healthcare services are delivered around the world” - is on its way to reality. For more information, check out http://engineering.columbia.edu/prof-sia-develops-innovative-lab-chip.

Bioneedle

Gijsbert van de Wijdeven, DVM, MSc, Co-founder and Chief Scientific Officer of Bioneedle Technologies Group, has an idea to deliver vaccines to animals and humans in a new way. Enter Bioneedle. This technology comprises a new and unique pharmaceutical polymer that is used to manufacture hollow, biodegradable, needle-shaped mini-implants - Bioneedles - as vaccine carriers. Thermosable vaccines are loaded by the manufacturer into these carriers to form vaccine-pre-filled-Bioneedles (VPBs). The loading capacity of a single Bioneedle is sufficient to hold up to 50 vaccines.

Benefits include painless vaccinations, since compressed air delivers the vaccine in less than one millisecond. Within moments of subcutaneous delivery, the polymer begins to degrade, thereby releasing the vaccine. There is no contaminated waste or chance of reuse (from needles, syringes, gloves, etc.) and no possibility of a needlestick injury. Any vaccine can be used and be made heat-stable, thus eliminating cold chain requirements. In an emergent situation, it is feasible to vaccinate 1,000 persons/hours by non-clinical personnel! Pre-loaded VPBs also mean reduced dosage errors and vaccine contamination than through standard practices.

This new system meets the requirements set by the World Health Organization and brings the opportunity to vaccinate children worldwide. Bioneedle also has the support of Minister Kamp, Economic Affairs, of the Netherlands, who says, “By being able to vaccinate quicker and cleaner, more people all over the world can be helped. The Bioneedle has the global potential to contribute to lowering the number of sick people and reduce mortality.” For more information, check out http://www.bioneedle.com/home/.

TB Biosciences

TB Biosciences mission is “to create a rapid, cost effective, point-of-care test (PoCT) to replace the 125-year-old sputum smear test, thus increasing clinicians’ ability to diagnose and treat those with active tuberculosis.” A distinguished team of researchers, led by Dr. Susan Zolla-Pazner and Dr. Suman Laal, have been working the past 20 years on this novel PoCT.

The M. tuberculosis (TB) organism has been around for centuries, with approximately 85% of cases occurring in...
the chest cavity. Symptoms vary when latent or active, and sometimes are quite elusive. Past attempts to develop PoCT have been unsuccessful. TB Biosciences works with a diverse group of small proteins and antibodies (markers) that are present in the serum of humans having active, infectious TB. These proteins and antibodies are absent in latent TB or negative patients. Using combinations of patented peptides, a higher than 90% sensitivity/specificity has been achieved. Primary use would be for TB control programs in endemic countries. Drug therapy could be initiated quickly. In the United States, it would be useful as an adjunct to rapidly identify active TB infection in high-risk populations, including immigrants from TB-endemic countries, veterans returning from these countries, prisoners and those residing in homeless shelters. For more information, check out http://www.tbbiosciences.com/.

Closing Thoughts
As stated in the Vimeo at Launch, Collective Genius for a Better World, “The quality of our lives resides in the quality of our health.” These ideas have global potential to save lives and reduce waste for a fraction of the usual cost of healthcare. The first two technologies (both innovators can be viewed at http://www.launch.org/) require minimal training to use and can be taken almost anywhere. Funding is the key issue for getting these improvements to low-income countries. Once these endeavors become self-sustaining, everyone benefits. Can you imagine how this technology could transform your workflow? For moi, sign me up to trial the Bioneedles during flu season! How about you?

Julie Schmid Research Scholarship

AOHP is accepting proposals for original research projects on current and/or anticipated issues in hospital-related occupational health. The Research Scholarship Award is $2,000. For more details, visit Awards and Scholarships at www.aohp.org or call Headquarters, 800-362-4347.

Deadline for submissions is July 1.
Perspectives in Healthcare Safety

By Cory Worden, MS, CSHM, CSP, CHSP, ARM, REM, CESCO

Editor’s Note: This issue of the Journal is pleased to introduce new columns featuring the expertise of two outstanding AOHP professionals. Cory Worden shares his insight in this column on safety in healthcare. Welcome, Cory! We are pleased to have you and anticipate learning a lot from you.

The Art and Science of Safety

Within the scope of healthcare employee safety, the Bureau of Labor Statistics national benchmark for OSHA-recordable injuries and illnesses is currently, as of 2014, 6.2 OSHA-recordable injuries or illnesses per 100 employees. This is in contrast to Oil and Gas Extraction’s rate of 2.0, Construction’s rate of 3.6 and Manufacturing’s rate of 4.0 (BLS, 2014). The healthcare profession presents a number of challenges in safety that may not exist in other industries; there are many variables and human factors in the healthcare environment that require not only hazard identification, assessment and control, but abilities to maintain situational awareness, make critical decisions and avoid hazards – in real time. Leading these efforts is not as simple as installing a machine guard or an interlock on a piece of equipment. It’s not as simple as donning Personal Protective Equipment (PPE) as a routine preparation for entering a certain area. It’s not as simple as maintaining a safe speed on a forklift. While the healthcare profession requires attention to safe conditions such as removing slipping and tripping hazards, maintaining safe sharps disposal containers, and ensuring the presence of safe patient handling equipment, it also requires consistent safe work practices and avoidance of what Wilson and Higbee (2012) call the “dangerous states of mind.” For example, it’s not enough for leaders to provide safe patient handling equipment; healthcare professionals must commit to find and use the equipment when needed. This requires situational awareness to assess each patient. It requires knowledge of each piece of equipment’s operations. Most of all, it requires avoiding the dangerous states of mind of rushing, fatigue, frustration and complacency (Wilson & Higbee, 2012), those human factors that can easily eclipse the ability to make a safe decision when performing a potentially dangerous task. Ultimately, to achieve high-reliability outcomes in healthcare, safe conditions must be provided and maintained as a prerequisite. Leaders must know what hazards exist in the workplace, provide the appropriate hazard controls as per this hazard analysis (often requiring OSHA-mandated hazard controls such as Respiratory Protection and Hazard Communication), consistently communicate expectations to use these hazard controls, observe and inspect to validate their use, and investigate any accidents to determine preventive measures to avoid future occurrences. These high-reliability measures develop:

• The necessary engagement. (Keep safety at the forefront of each decision.)
• Decentralized decision making. (Will employees choose to work safely even when nobody is watching?)
• Lateral communication. (Can employees openly speak to supervisors about safety concerns?)
• Perceived values of safety. (Does everyone in the organization believe safety to be an organizational value?)

This not only develops positive outcomes in accident prevention, but connects them with the necessary procedures to duplicate these outcomes. This is high-reliability (Bourrier, 2011). This is an art and a science.

Art and Science

If it is known that the use of safe patient handling equipment removes the weight and force of a patient from the employee when being transferred or repositioned, this is science. If it is known that the placement of a tuberculosis (TB) patient in an isolation room prevents the transmission of the disease, this is science. If it is known that donning an N95 respirator can prevent the transmission of many aerosol transmitted diseases, this is science. Within the hierarchy of hazard controls, the first three steps – hazard elimination, hazard substitution and engineering controls – allow for science. These steps provide a means to physically separate employees from hazards. However, the remaining steps on the hierarchy of controls – administrative controls and PPE use – require more than implementations of hazard controls (Haavik, 2011). Instead, these controls require employers to provide processes, training, equipment and PPE, but also employee decisions, situational awareness and critical thinking to use them. For example, an employer’s implementation of respirators and a respiratory protection program to prevent TB exposures may be based on science, but they are not effective unless each employee maintains situational awareness to identify symptomatic patients, determine the need for a respirator, and choose to locate and don a respirator at the critical moment before an exposure occurs. Ensuring these employee performances is an art form. It is leadership in its purest form. It is ensuring open communication,
unification around a value of safety, professional development, training, and a sense of service to one’s teammates and profession. These are hallmarks of transformational (Rehman & Waheed, 2012) and servant (Dierendonck, 2011) leadership. This leadership is an art form. Knowing how to balance between decentralization and transactional directives needed to manage an emergent situation such as the arrival of an Ebola patient is contingency leadership (Hansich & Wald, 2012). This is an art form. Ultimately, leaders must maintain diligence and vigilance to provide hazard controls as per their departments’ hazard analyses – science – but employees must remain actively aware of their surroundings, determine what hazard controls are necessary at any given point and choose to use them, an art. Without the art and science of safety, improvement cannot become a reality. However, with each leader’s and each employee’s personal buy-in to a safety culture, a true high-reliability safety culture can succeed beyond expectations.

References


NIOSH Launches Total Worker Health® Center to Promote Lifelong Worker Well-being: The National Center for Productive Aging and Work

As we move further into the 21st century, converging demographic, economic and cultural trends have made population aging one of the most important issues facing U.S. workers and businesses. In this context, however, far less attention has been paid to the safety and health needs of older workers. Today, according to the U.S. Bureau of Labor Statistics, one in five American workers is over 65. In 2020, one in four American workers will be over 55. The increased and projected labor participation rates of older workers show the substantial role of older workers in the workforce today and in the future. At this critical juncture, forming the NIOSH National Center for Productive Aging and Work is more relevant today than ever before. The new virtual Center, the first to be hosted by the NIOSH Office for Total Worker Health®, will focus on the safety of workers of all ages, promote their lifelong well-being, and advance the concept of productive aging.

For more information on productive aging and work, including the latest NIOSH research, tools, guidelines, data and statistics, please visit the Center’s new web home:

http://www.cdc.gov/niosh/topics/productiveaging/default.html.
Mites, Oh No!
What You are Itching to Know about Mites

By Karen Ninassi, MSN, BSN, RN

Has your facility ever experienced an infestation of scabies mites? The answer is probably yes! Scabies, pronounced skay-bees, is increasing in many of our healthcare facilities, although it is more prevalent in nursing homes, long term care facilities and prisons. Scabies dates back to 2,500 years ago and globally, there are greater than 300 million people affected yearly (Thomas et al., 2015). Giovanni Cosimo Bonomo discovered the scabies mite in 1687. This made scabies of the earliest diseases with an identified cause (Orrico & Krause-Parello, 2010).

The exposure occurs to both patients and employees. It can be a small exposure to a large exposure, affecting many if not caught and diagnosed early. Immediate action needs to take place to control these outbreaks to a manageable level. Instant identification of the case; assembly of a proper team, such as Infection Prevention, Employee Health and specialized physicians; defining the degree of the outbreak and identifying the risk factors; implementing infection control practices; education; treatments; and environmental decontamination are important plans to have in place (Bouvresse & Chosidow, 2010).

What is scabies? It is an infestation of a mite. These little mites tunnel under the skin and typically leave track marks. When moving around, they lay eggs at different sites over the body. Characteristically, the areas look like an edematous rash that is extremelyitchy. It tends to turn up in areas such as under the armpits and around the breast, waist, groin and buttocks. It can also been seen on the wrists and feet, between the fingers and toes, and on the folds of the elbows or knees (CDC, 2010).

There are many different types of scabies. Norwegian scabies, also known ascrusted scabies, is the most severe and can be atypical with its rash. This type of scabies forms large areas of thick crusts of skin that house a considerable amount of mites and eggs. Scabies is usually spread by direct skin-to-skin contact for prolonged periods of time, but Norwegian scabies, which is extremely contagious, can also be spread through contact with contaminated items, such as bed linens and clothing. If your exposed employee has never had scabies before, it can take up to four to six weeks for the rash to develop. If the employee has had scabies before, it may be only a matter of one to four days before the rash is visualized (CDC, 2010).

Diagnosis usually occurs by taking scrapings of the various burrowed sites. The specialist conducting the test needs to find the eggs, scybala or scabies. With a classic scabies exposure, there are approximately about 10 to 15 mites over the entire body, but with Norwegian scabies, a person can be infested with thousands or even millions (CDC, 2010). If left untreated, they can live on a human source for four to eight weeks. Without a human source, their life expectancy is much shorter, usually 48 to 72 hours. One treatment after diagnosis is 5% permethrin cream. This is applied in an adult behind the ears, under the neck, all the way to the toes. You have to instruct the employee to apply it between their fingers and toes. It is left on for eight to 14 hours. In children, it can be applied to the head. Eggs can hatch after one week, so it is recommended to reapply the cream again in one week. Washing of clothes and linens is recommended.

Although 5% permethrin cream is one avenue of treatment, there are other options. If the rash is persistent and active eruptions develop, then other medication options will need to be considered, which include “1% lindane...lotion, 6% precipitated sulfur in petrolatum, crotonit, malathion, allethrin spray and benzyl benzoate. Ivermectin, the only oral treatment, is not approved for scabies in the United States...Ivermectin is useful in treating patients with Norwegian or crusted scabies” (Scheinfeld, 2004, p. 31). Hydrocortisone can be prescribed for the severe itching that can accompany the rash. Triamcinolone cream 0.1% can also be used as another means of treatment. It is recommended that you follow your facility’s policy. What is your process? It is imperative to be proactive and have steps in place before you are faced with a large outbreak. Is your facility prepared for an exposure? What is your usual protocol? These exposures, if not caught early, can lead to hundreds of employees being exposed. Is your hospital prepared to treat family members? When an employee is exposed and has an active rash, it is best to treat the family member(s) as well. Animals are not prone to getting this type of human scabies.

Here are some important questions to think about when implementing a process:

• Does your facility have a means of reporting injuries and illnesses?
• Who takes care of the patients; the teammates?
• Do you have a physician or specialist on board who can diagnose the person who presents with symptoms?
• Are you prepared to treat family members, too?
• Does your hospital carry a substantial...
supply of medication, or can they order and have the medication delivered immediately?

- How will you track all the employees and the departments treated? Do you have someone to produce/run reports?
- Do you have a team of experts available that can handle the various aspects of the exposure; i.e. Employee Health, Infection Prevention, Physician Specialists, Workers’ Compensation and Safety?
- Can you set up an Incident Command Center immediately?
- Do you have communication in place to convey the importance of the message to leaders, managers and employees?

Are you asking the right questions when speaking to someone who may have been exposed?

- Do you have a rash?
- What was the date of onset of your rash?
- What are the names of patients/employees you have been in close contact with?
- Are any family members affected? If so, what is the name, date of birth, allergies?
- Did you complete the report for occupational injury or illness form? (Use your facility based report form).

If medications are appropriate, gather the appropriate information for ordering the medication through your pharmacy, including name, date of birth, employee identification number, address, allergies and department number. The employee will need to stay out of work for 48 hours and be seen by Employee Health before returning to work.

Having such a huge exposure is not the responsibility of only one person or one department. It requires teamwork among multidisciplinary departments and involves a great deal of people. Setting up a team, having a physician and knowing the steps you would take if this were to occur are important. Developing guidelines is essential for a program to run smoothly and for your team to be ready if and when the exposure occurs.

Your program should include the following:

- Surveillance
  - Vigorous program for early discovery
  - Increased indicator of suspicion
  - Screen all incoming patients and staff
  - Report to health department and other organizations as necessary
- Continuing surveillance
- Diagnostic services
- Dermatologist consult
- Trained staff for identification of scabies mite
- Control and treatment
  - Keep records
  - Isolate patients
  - Contact precautions
  - Use proper personal protective equipment, i.e. gloves and gowns
  - Wash hands
  - Avoid direct skin-to-skin contact
  - Regular assigned caregivers
  - Reduce visitors
  - Treat patients, employees and family members that have encountered prolonged skin-to-skin contact
  - Avoid secondary outbreaks
- Environmental disinfection
  - Appropriate transport of garments, bedding in plastic bags
  - Wash linens, gowns, etc. appropriately
  - Meticulous cleaning and vacuuming of rooms regularly
- Communication
  - Educate staff about scabies
  - Communicate to all levels of management the exposure plan
  - Communicate to employees the exposure plan (CDC, 2010).

If a large outbreak does occur and you have a solid plan in place, you will be well prepared to handle the situation. Following your facility’s policies and using available resources like the CDC will assist you in managing this outbreak. Do not get caught without a viable, sustainable plan in place, or you may find yourself involved in a Root Cause Analysis to see what opportunities you could have taken to make improvements. Be proactive, and plan today!

References

Karen Ninassi has been a nurse since 1990 and an AOHHP member since 2011. She has four years of experience in Employee/Occupational Health at Carolinas Healthcare System and 25 years of experience in nursing. She earned her ASN in 1990 from Valencia Community College, BSN in 2005 from the University of Phoenix, and her MSN in 2014 from Grand Canyon University. Her professional career started in the Neonatal Intensive Care Unit (NICU), where she practiced for 17 years. She has taken on many roles in her career, including: Senior Charge Nurse; ANM; Interim Nurse Manager over NICU, Post-Partum, OB-GYN and Pediatrics; and Nurse Manager over Labor & Delivery and OB Triage. In 2011, Karen joined Employee Health and was promoted to Manager in June 2014. She holds licenses in North Carolina and Florida as a registered nurse. Karen has served as Vice President for the NC Association of Occupational Health Professionals since October 2013 for Chapter 5. She has also written an article for La Noticia magazine, “La importancia de la vacuna contra la influenza.”
CALL FOR SPEAKERS

AOHP is soliciting presentation submissions for the AOHP 2016 National Conference, scheduled for next fall in South Carolina. The speaker submission will occur in two phases. The first submission will help the committee decide if the presentation meets the needs of the conference.

Deadline to submit: January 29, 2016.
Successful applicants will be notified by April 15, 2016.

Suggested topics (but not limited to):
- Blood and body fluid exposure management.
- Influenza: Beyond Vaccination. Review the impact of mandatory vaccination on worker health, nosocomial influenza, absenteeism.
- Fitness for duty as relates to policy, interactive process with employee, appeals, legal issues.
- Impaired Practitioner: Investigation, testing, update on return to practice.
- OSHA Inspections: Step by step, how to appeal, take pictures, training and retraining.
- Management and Development of an Effective Wellness Program: budget, job descriptions, how to make a case.
- Employee Health Role in emergency preparedness or Emergency Response Team.
- Business-oriented classes, organizational charts, program management.
- TB/Hepatitis C update.
- FMLA and leave management.
- Dealing with Worker Injuries/Safe Patient Handling.
- How OHPs can demonstrate value to management using metric tools.
- Immunization updates related to CDC requirements for healthcare professionals.
- Ergonomics.
- Mental health topics, including methods for identification and screening.
- Workers’ compensation.
- Case management of occupational health issues.
- Aging workforce.
- Laser safety.
- Managing emerging infectious diseases with appropriate surveillance program implementation.
- “Future trends.” What’s coming, and what changes need to be made to prepare.
- Workplace violence.
- Employee safety behaviors and accident prevention.
- Stress reduction.

Download speaker submission information at
For more information, please contact Annie Wiest at AOHP Headquarters via email: info@aohp.org or phone: 724-935-1531.

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Articulating AOHP Conference Attendance Value Guideline

Articulating AOHP Conference Attendance Value Quick Overview
Notes from the Field: Measles in a Patient with Presumed Immunity — Los Angeles County, 2015

By Amanda Kamali, MD; Chhandasi P. Bagchi, MPH; Emmanuel Mendoza, MPH; Dulmini Wilson, MPH; Benjamin Schwartz, MD; Laurene Mascola, MD

On February 14, 2015, patient A, aged 17 years, was seen in an emergency department for evaluation of reactive airway disease. In the waiting room at the same time were two siblings, aged 6 months, presenting with fever and rash; these two children (patients B and C) were later confirmed to have measles. Patient A began a 5-day course of oral prednisone (50 mg per day); however, symptoms continued, and patient A returned to the emergency department the next day and received 125 mg of intravenous (IV) methylprednisolone. Patient A had documentation of receipt of 2 doses of measles, mumps, and rubella (MMR) vaccine at ages 12 months and 4 years.

A contact investigation was initiated by the hospital to identify all persons who might have been exposed to patient B or patient C. An infant aged 10 days was identified within the first 6 days of exposure and offered postexposure prophylaxis with intramuscular (IM) immune globulin. A second infant was identified later and was outside of the window period for immune globulin. Patient A was not identified as a susceptible contact in the investigation because of the documented history of receipt of MMR vaccine. Patients B and C had returned to the hospital on February 17, before receiving a diagnosis of measles, and exposed three other susceptible children (two infants aged <12 months and a child aged 3 years with leukemia). One infant was offered MMR vaccine, the other IM immune globulin, and the child with leukemia was offered IV immune globulin. On March 2, 16 days after the first emergency department visit, patient A was hospitalized for vomiting and dehydration. Patient A was also found to be febrile and to have a confluent popular rash that began on the face and spread to trunk and extremities and had small vesicular oral lesions. Measles was confirmed by laboratory testing, and patient A received supportive treatment with anti-emetics and IV fluids.

Patients A, B, and C were part of a measles outbreak originating at the Disney theme park in Orange County, California, in December 2014, which included 28 confirmed cases in Los Angeles County. As of April 17, 2015, a total of 136 measles cases had been documented in California, and among those, 10 patients had received at least 1 dose of MMR vaccine, 13 had received 2 doses, and two had received 3 doses (*; Jennifer Zipprich, PhD, Kathleen Harriman, PhD, California Department of Public Health, personal communication, June 2015). Measles is highly contagious, and high levels of population immunity are required to prevent transmission to susceptible persons. MMR vaccine is highly effective, with a single dose conferring immunity in 92%–95% of persons; however, because vaccine failures do occur, a second dose of measles vaccine has been routinely recommended since 1989. Complications associated with measles include pneumonia, otitis media, diarrhea, and encephalitis; postexposure prophylaxis is recommended for all susceptible contacts. MMR vaccine, if administered within 72 hours of initial measles exposure, might provide some protection or modify the clinical course of disease. Persons who are at risk for severe illness and complications from measles who cannot receive MMR vaccine, including infants aged <12 months, persons who are severely immunocompromised (including persons taking high-dose steroids for ≥2 weeks), and persons with leukemia or lymphoma, should receive prophylaxis with immunoglobulin within 6 days of exposure.

Patient A had received 2 doses of MMR vaccine and did not meet criteria for being severely immunocompromised; however, this patient did develop measles after being exposed in the setting of a hospital emergency department to patients with laboratory-confirmed measles. Although it is not known whether patient A developed immunity to measles in response to the 2 administered doses of MMR vaccine, or whether patient A had an unrecognized immunocompromising condition, the recent steroid use might have weakened the patient’s immune response and rendered patient A susceptible to wild measles strain. The diagnosis of measles in patient A highlights the concern that immunocompromised and susceptible persons might be exposed in a health care setting. More information is needed concerning the effect of immunomodulating drugs on vaccine-induced immunity to measles and other vaccine-preventable diseases.

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Kim Stanchfield, AOHP Journal Executive Editor announced 2015 Journal Contributors.

Left: Incoming Executive President Mary Bliss
Right: Outgoing Executive President Dee Tyler

2015 National Conference Chair Curtis Chow, FNP, PA-C, COHN-S, CEES, CSPHP

Annual Business Meeting and Luncheon sponsored by QIAGEN
SEPTEMBER 9-12, 2015

2015 National Conference Chair Curtis Chow, FNP, PA-C, COHN-S, CEES, CSPHP

Keynote Speaker - Lee S. Newman, MD, MA, FACOEM, FCCP

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Methicillin-resistant Staphylococcus Aureus (MRSA) Infections

General Information About MRSA in the Community
MRSA is methicillin-resistant Staphylococcus aureus, a type of staph bacteria that is resistant to several antibiotics. In the general community, MRSA can cause skin and other infections. In a healthcare setting, such as a hospital or nursing home, MRSA can cause severe problems such as bloodstream infections, pneumonia and surgical site infections. For more information visit MRSA in healthcare settings (http://www.cdc.gov/mrsa/healthcare/index.html).

Who is at Risk, and How is MRSA Spread in the Community?
Anyone can get MRSA through direct contact with an infected wound or by sharing personal items, such as towels or razors, that have touched infected skin. MRSA infection risk can be increased when a person is in certain activities or places that involve crowding, skin-to-skin contact, and shared equipment or supplies. This might include athletes, daycare and school students, military personnel in barracks, and people who recently received inpatient medical care.

How Common is MRSA?
Studies show that about one in three people carry staph in their nose, usually without any illness. Two in 100 people carry MRSA. There are not data showing the total number of people who get MRSA skin infections in the community.

Can I Prevent MRSA? How?
There are the personal hygiene steps you can take to reduce your risk of MRSA infection:
• Maintain good hand and body hygiene. Wash hands often, and clean body regularly, especially after exercise.
• Keep cuts, scrapes, and wounds clean and covered until healed.
• Avoid sharing personal items such as towels and razors.
• Get care early if you think you might have an infection.

What are MRSA Symptoms?
Often, people first think the area is a spider bite; however, unless a spider is actually seen, the irritation is likely not a spider bite. Most staph skin infections, including MRSA, appear as a bump or infected area on the skin that might be:
• Red
• Swollen
• Painful
• Warm to the touch
• Full of pus or other drainage
• Accompanied by a fever

What Should I Do if I Think I Have a Skin Infection?
You can’t tell by looking at the skin if it is a staph infection (including MRSA).
• Contact your doctor if you think you have an infection so it can be treated quickly. Finding infections early and getting care will decrease the chance that the infection will become severe.
• Signs of infection include redness, warmth, swelling, pus, and pain at sites where your skin has sores, abrasions, or cuts. Sometimes these infections can be confused with spider bites.
• Infections can also occur at sites covered by body hair or where uniforms or equipment cause skin irritation or increased rubbing.
• Do not try to treat the infection yourself by picking or popping the sore.
• Cover possible infections with clean, dry bandages until you can be seen by a doctor, nurse, or other health care provider such as an athletic trainer.

How to Prevent Spreading MRSA If You Have MRSA
• Cover your wounds. Keep wounds covered with clean, dry bandages until healed. Follow your doctor’s instructions about proper care of the wound. Pus from infected wounds can contain MRSA so keeping the infection covered will help prevent the spread to others. Bandages and tape can be thrown away with the regular trash.
• Clean your hands often. You, your family, and others in close contact should wash their hands often with soap and water or use an alcohol-based hand rub, especially after changing the bandage or touching the infected wound.
• Do not share personal items. Personal items include towels, washcloths, razors, clothing, and uniforms.
• Wash used sheets, towels, and clothes with water and laundry detergent. Use a dryer to dry them completely.
• Wash clothes according to manufacturer’s instructions on the label.

How are MRSA skin infections treated?
Treatment for MRSA skin infections may include having a healthcare professional drain the infection and, in some cases, prescribe an antibiotic. Do not attempt to drain the infection yourself – doing so could worsen or spread it to others. If you are given an antibiotic, be sure to take all of the doses (even if the infection is getting better), unless your doctor tells you to stop taking it.

Provided by Centers for Disease Control and Prevention
Occupational Exposures to Blood and Body Fluid Splashes and Splatters: A 10-Year Surveillance Collaborative

By Amber Hogan Mitchell, DrPH, MPH, CPH1, Janine C. Jagger, MPH, PhD2, Ginger B. Parker, MBA3

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Introduction
Twenty years ago, a groundbreaking paper was published by the International Healthcare Worker Safety Center describing the risk healthcare workers face related to blood and body fluid (BBF) exposures.1 It reminded us, even then, that while percutaneous injuries, needlesticks in particular, are generally recognized as the most common mechanism of bloodborne pathogen transmission, a great deal of risk is associated with splashes and splatters of BBF, especially to mucous membranes like the eyes, nose and mouth.

This paper is the long awaited update to that important 1995 Exposure Prevention Information Network (EPINet®) report on BBF exposures and the first major publication coming out of the newly revamped International Safety Center (www.internationalsafetycenter.org), which is now free-standing and non-profit. It is an important contribution to both the scientific and healthcare communities, especially now, as this past year the United States was faced with the threat of globally emerging infectious diseases like the Ebola virus. As a nation, we watched as our public health officials described the danger of not wearing the appropriate personal protective equipment (PPE) to protect those caring for suspected or known Ebola victims.

Since the original paper was written, the public health and healthcare communities have also built systems to protect the public from SARS, MERS Co-V and threats of bioterrorism with infectious agents such as smallpox and anthrax. While the likelihood of widespread infectious disease like this is extremely small in our healthcare facilities or in our communities, it is important to remember that microorganisms that cause infection and illness are also transmitted via blood, body fluids and contact, including but not limited to: bloodborne pathogens like HIV, HBV and HCV; multidrug resistant organisms like methicillin resistant staphylococcus aureus (MRSA), Clostridium difficile (C.diff) and Acinetobacter baumannii; and even seasonal communicable diseases like Influenza (flu) and the common cold. Additionally, because HIV patients are living with what is now considered a chronic rather than fatal disease, community-associated MRSA (CA-MRSA) infection is actually six-fold higher among HIV-positive patients (996/100,000) and significantly increasing since 2000.2

Since the original paper was written, the dynamics of healthcare have also changed. Workers in healthcare now represent the largest work sector, employing more than other industries, including manufacturing and construction; infectious disease burden of patients is higher; mucous membrane exposures to BBF are high risk; and PPE compliance as a protective measure is low; therefore, there is a high level public health impact and need for research to drive action.3,10 Recognizing the need for continued surveillance and research, other organizations have explored the impact of BBF exposure. The Exposure Study of Occupational Practice (EXPO-S.T.O.P) examined national BBF exposure rates experienced at hospitals represented by members of the Association of Occupational Health Professionals in Healthcare (AOHP). Findings from the 2011 EXPO-S.T.O.P study estimated that 120,000 exposures occur annually from mucous membrane/non-intact skin contact with BBF.11,12

Transmission of infectious microorganisms poses a threat not just to healthcare workers in direct contact with patients, but can also be spread via contaminated hands, apparel/uniforms, patient care items (e.g. IV poles, privacy curtains, blood pressure cuffs) or environmental surfaces to allied professionals like environmental services or clergy, visitors, family and friends. BBF exposures tend to be under-reported by those workers experiencing them because they may think it a normal and ongoing pitfall of the job or because they may have difficulty in attributing an infection to a specific skin or mucous membrane exposure. As such, many public health organizations believe this type of exposure occurs infrequently. On the contrary, ask any healthcare worker, and they can attest that BBF exposures are occurring more frequently than needlesticks and with higher volumes of fluids. In addition to the frequency of these types of exposures, healthcare workers are often unprepared for them when they do happen.

BBF exposures are so common in many clinical settings, such as emergency departments and obstetrics, that healthcare workers are not likely to report an event they view as a routine occurrence. Thus, some occupational infections resulting from routine and repeated contact with BBF are probably not recognized or documented as such. Cases of occupational HIV infection have been reported in which there was a history of contact with HIV-contaminated (or potentially...
contaminated) blood or lab samples, but in which no percutaneous injury or other specific exposure was recalled.\textsuperscript{13} Some studies have shown higher prevalence rates of bloodborne pathogens in healthcare workers employed in exposure-intensive settings than in control groups or in the general population, providing indirect evidence that transmission may occur despite the lack of documented seroconversions.\textsuperscript{14-18} These reports illustrate the difficulty of linking exposure events to infections, and may in part explain why relatively few documented cases of bloodborne pathogen transmission via mucocutaneous route are found in the medical literature.

The healthcare worker’s first line of defense against exposure to BBF is PPE, including gloves, liquid-resistant gowns, face masks, face shields, goggles, head covers, shoe covers and other more specialized garments. The effectiveness of PPE depends on whether the design of the protective garments matches the distribution of BBF contact, whether the garment material is adequately liquid resistant, and whether the appropriate garments are worn when needed. When BBF exposures occur, they reflect either non-compliance with PPE requirements, a failure of protective garments to provide an adequate barrier, or unanticipated circumstances that the healthcare worker was unable to prepare for — a common situation in the complex environment of a hospital.

However, even given the most effective barrier garments or PPE, compliance wearing the appropriate PPE is lower than hand hygiene rates in most cases — in fact, in only about 25% of incidents occurring in traditionally lower risk hospital settings (e.g. outside patient rooms, clinical laboratories, outpatient clinics) were workers wearing any type of PPE when an exposure occurred.\textsuperscript{19} EPINet data collected and analyzed over a 12-year span disturbingly shows that in only 2-3% of all nose and mouth exposures were workers wearing the appropriate PPE (e.g. mask, face shield).

Skin or mucous membrane contact with patients’ BBF is frequent in most healthcare institutions. In a survey of workers in a hospital’s clinical laboratories — a highly regulated environment — respondents reported an average of 4.6 BBF contacts per year. Only 2% reported their most recent BBF contact to their employee health department, a much higher underreporting rate than is generally noted for percutaneous injuries.\textsuperscript{20} A similar survey conducted among personnel in an emergency department — a less predictable and more body fluid-intensive environment — revealed an average of 56.5 BBF contacts per person per year. Only 4% reported their most recent BBF contact to employee health.\textsuperscript{21} Not all incidents, however, were considered at-risk exposures because the vast majority of BBF contacts in both the clinical labs and the emergency department were to intact skin only (95% and 88%, respectively).\textsuperscript{22-23} Of BBF contacts to non-intact skin or mucous membranes among emergency department personnel, 38% were reported to employee health. In the same study, 39% of emergency department personnel reported their most recent percutaneous injury to employee health. This comparison suggests that underreporting rates for BBF contacts to non-intact skin or mucous membranes may be similar to underreporting rates for percutaneous injuries.

Data originating from employee health records represent only a small fraction of actual BBF contacts occurring in clinical areas, and they are more likely to include incidents that involve BBF contact with non-intact skin or mucous membranes. When interpreting these data, potential reporting biases must be kept in mind. Nevertheless, employee health records provide a valuable source of information for defining the characteristics of body fluid contact and the circumstances under which they occur. These data are also useful for monitoring compliance with current policies, and are especially important for identifying prevention opportunities and emerging exposure risks.

**Methods**

A cohort of seven hospitals voluntarily participating in a data-sharing network contributed data for this report; they are located in four states in the eastern half of the United States. All hospitals use the EPINet system for tracking both percutaneous injuries and BBF exposures, and they reported their data annually to the International Healthcare Worker Safety Center. EPINet was developed in 1991 to provide standardized methods for recording and tracking percutaneous injuries and BBF contacts. The EPINet system consists of a Needlestick and Sharp Object Injury Report and a BBF Exposure Report, and software programmed in Access® for entering and analyzing the data from the forms. Since its introduction in 1992, more than 1,500 U.S. hospitals have acquired EPINet for use. It has also been adopted in over 90 other countries, including, Australia, Italy, Ireland and Japan.

The present study is a follow-up to the 1995 publication described above and includes descriptions of BBF exposures reported to the employee health department of each institution during a 10-year period from January 2003 through December 2012. We have identified this 10-year period as an important time span because it illustrates the frequency of BBF exposures that occurred after promulgation of the Needlestick Safety and Prevention Act in 2001 and its incorporation into the OSHA Bloodborne Pathogens Standard. This dataset also affords the ability to capture an accurate description of a broader set of exposures, including those that may or may not be OSHA recordable.

**Results**

The average daily census for the seven hospitals used for the calculation of rates was 24,831 occupied beds. Healthcare workers file exposure reports regardless of the severity of the incident, including higher risk incidents such as blood contact with non-intact skin or mucous membranes and lower-risk incidents such as blood or other fluid contact with intact skin.

There were 1,891 BBF reports during the 10-year interval, which accounted for 33% of the total incidents reported through EPINet on either the sharps ob-
ject injury report form or the BBF report form. The average annual reported BBF exposure rate was 7.6 BBF exposures per 100 occupied beds.

The following sections will describe BBF exposure (or contact) reports in more detail. Identifying specific characteristics or variables of exposures helps to identify what parameters, if any, can be addressed to identify incidents that can be prevented or minimized through the use of the controls established in the hierarchy of controls (i.e. substitution, administrative, engineering or work practice controls, or PPE). Exposures were indicated as counts and percentages. No advanced biostatistical analyses were performed in an effort to directly compare these results to the original data published in 1995.

Job Categories of Workers Reporting BBF Contacts

Over the 10-year period in the network of hospitals, nurses reported 50.8% of all incidents, far more than other job categories (Figure 1). This number may reflect a combination of the large number of nurses employed by these facilities, as well as the frequency of patient contact. Physicians (including residents) reported 11.2% of incidents. Other technical or specialty job categories accounted for 27.5% of cases, including laboratory and other technicians, paramedics, surgery and other attendants, respiratory therapists, phlebotomists, intravenous nurses and students. Non-technical jobs such as nurse assistants, environmental services, housekeepers and security make up the remaining 10.5%.

Standard Precautions applied to 7% of healthcare workers, including paramedics, nursing assistants, home health aides and housekeeping / environmental services. However, 6.4% of those cases involved personnel who might not anticipate exposure to patients’ body fluids, and are therefore not likely to be prepared for body fluid contact. These types of incidents were experienced by security personnel (44 cases) and clerical personnel (23 cases.) There were 19 incidents reported by speech, physical or occupational therapists and five incidents reported by mental health workers. Some incidents were even reported by other personnel not providing direct patient care, including an interpreter, customer service specialist, concierge and project coordinator.

Location of BBF Contacts in Hospitals

Thirty-five percent (35%) of reported exposures occurred in patient rooms, which is a substantially higher percentage than in any other area of the hospital (Figure 2). This may reflect a high proportion of care that is now provided in patient versus procedure rooms. The operating room (OR) accounted for 16.4% of all reports. Although blood contact is relatively frequent in the blood-intensive environment of surgery, healthcare workers are typically prepared for exposures and are wearing PPE, or reporting an exposure to employee health may be considered inconvenient, as personnel may not report until after the surgical procedure is complete. The remaining incidents were widely distributed among intensive and emergency care areas, diagnostic and treatment procedure areas, procedure rooms, labor and delivery, and clinical laboratories where BBF specimens are continually handled.

Fifty-three incidents (53) were described as occurring in “other areas” of the hospital. Many of these incidents occurred in a non-treatment area such as a cafeteria, pharmacy, autopsy/pathology lab, lobby or research lab. Thirty cases (30)
occurred outside of hospitals including incidents in ambulances, patient homes (during home care), parking lots, on the sidewalk and at accident scenes. These cases illustrate the complex and varied interactions between hospital personnel, patients and the environments in which care or services are provided.

**Body Fluids Involved in Exposures**

Seventy-four percent (74%) of incidents involved blood or blood products (Figure 3). A wide variety of other fluids were identified in the remaining cases. More than one body fluid could be selected by respondents, so combined totals can exceed 100%. For example, urine may contain blood, so an employee may tick both “urine” and “blood”. Urine was the most frequent body fluid reported (80%), followed by sputum (10%) and saliva (8.1%). Peritoneal fluid, pleural fluid, vomit, cerebrospinal fluid and amniotic fluid together accounted for 8.2% of reports. Given blood and urine together were the most frequently indicated, it can be interpreted that visibly bloody urine represents by far the most common exposure. Thirteen percent (13%) of reports did not fall into any of the provided categories and involved fluids such as abdominal irrigation fluids, bile, abscess and cyst drainage fluids, endotracheal secretions, nasal secretions, vaginal secretions, wound discharge, gastric fluids and feces.

**Items Worn at the Time of Exposure**

In 80% of cases, BBF exposure was to an unprotected body area (Figure 4), indicating that in the majority of cases, an appropriate protective garment or PPE was not worn at the time of contact. In 7.5% of cases, BBF exposure occurred at the gap between garments, often at the wrist between a glove and sleeve. In 2.3% of cases, BBF soaked through clothing, and in 1.1% of cases, BBF penetrated protective garments.

Gloves were worn at the time of BBF exposures in 75% of the total reported incidents, and were therefore the most commonly worn barrier or PPE. However, hands were the second most frequent body area (12.7%) (after the face) exposed to BBF, which we assume means that when reporting exposure to a different body part, healthcare workers were also wearing gloves. Interestingly, in only 37% of hand exposures were workers wearing gloves. The risks associated with this behavior are explored below in the discussion section.

Of the 1,201 BBF exposures to the eyes (mucocutaneous), 78% were not wearing any kind of eyewear or eye-appropriate protective barrier or PPE (goggles or face shields). Again, of the 1,891 total exposures, 1,201 (63%) were to the eyes. Eyeglasses (while considered non-protective and not PPE) were worn by 15% of workers at the time of BBF exposure, but protective eyewear, including goggles or face shields, was worn at the time of exposure in only 7% of cases.
Another high risk exposure is to the nose or mouth, also considered mucous membranes (mucocutaneous). There were 210 (11%) mouth exposures and 80 (4%) to the nose. While these types of exposures were reported lower in frequency, they are associated with the lowest indication of PPE worn. Only 5% of those mouth exposures and only 4% of those to the nose were wearing a face shield or mask. This means that BBF are entering directly into the mouth or nose in nearly 95% of these cases. This poses an enormous risk for transmission of infectious microorganisms and will be discussed further below.

The infrequent use of cover garments (e.g. lab coats, isolation gowns) for the torso and arms was notable. Only 18% of healthcare workers were wearing protective or surgical gowns at the time of BBF contact, and just 2% of workers wore cloth lab coats. Workers wearing a surgical-type fluid-resistant gown at the time of exposure sustained the fewest torso or arm exposures, suggesting the highest level of protection from BBF exposure incidents.

**Quantity / Volume of Body Fluid**

Workers were asked to describe the quantity of BBF that came into contact with their skin or mucous membranes. In most cases (87.2%), the quantity was less than 5cc of fluid. In 8.5% of cases, the reported BBF quantity was from 5cc to 50cc. In only 4.3% of cases was BBF quantity greater than 50cc (approximately 3 tablespoons or 1/3 of a cup). The quantity of BBF (especially blood) coming into contact with a healthcare worker, however, is not necessarily correlated with the risk of pathogen transmission. A small quantity of infected blood on non-intact skin or conjunctiva, for example, may have a higher risk of pathogen transmission than a larger quantity of blood on intact skin. As little as a non-visible, microscopic number of colony forming units (CFUs) can cause transmission of illness or infection.

**Type of Body Location Exposed**

Healthcare workers indicated the type of body location, to include skin and mucous membrane, exposed to BBF (Figure 5). In some cases, more than one type or body area per exposure was reported. BBF contact with intact skin occurred in 37.5% of reported incidents, and with non-intact skin in 14.2%, and as stated before, with only 7.5% wearing a protective garment. Mucosa of the mouth was involved in 11.1% of incidents and mucosa of the nose in 4.2% of incidents, as stated before, with only 3.8% wearing mouth or nose appropriate PPE. Of note was the high percentage of incidents (67.6%) that involved BBF exposures to the head and face. Because of proximity to the mucosa (eyes, nose, mouth), these are extremely high risk exposures. Sixty-three percent (63%) of incidents involved BBF contact specifically with eyes. Exposures to the face and eyes are alarming, as they are extremely high risk and can impair the senses of sight, smell and taste. Because these exposures are the most intrusive, they likely have a greater probability of being reported.

One mechanism of facial exposures was identified that has not been previously described in the literature. A review of 390 detailed descriptions of facial exposures from one of the seven EPI Net hospitals showed that 14 different incidents (3.6%) involved patients spitting into the faces of healthcare workers. Many of these incidents occurred when restraining combative patients; protective face shields, therefore, should be considered appropriate protective equipment in such situations. It is with these types of exposures that we see similarities to workplace violence incidents.

**Mechanism of Exposure**

In 59.2% of all cases reported to employee health, the BBF exposure was the result of direct patient contact (Figure 6). An unexpected finding, however, was that in most of the remaining cases (over 35%), a medical device or product served as a vehicle of exposure. In 10.2% of cases, a specimen container or other type of body fluid container, such as a suction canister, leaked or spilled, and in 9.9% of cases, feeding, ventilator or other tubing separated, leaked or spilled. In 3.1% of cases, healthcare workers touched contaminated items such as soiled drapes, laboratory equipment or surgical instruments. Incidents in the “other” category involved splashes, squirts or sprays with a variety of devices and items, including syringes, “chemstrips”, drainage bags and wound dressings. These incidents occurred while irrigating, washing, injecting, disconnecting equipment components, or emptying body fluid containers. Several of those “other” cases (7.7%) involved tubes, bags or pumps mainly associated with intravenous, arterial or central lines, equipment used to pump blood under pressure. Exposures occurred when vascular lines were removed, when junctions in the tubing circuits separated and when lines were flushed under pressure.
Workers in healthcare are still far from the ideal situation of being able to accurately anticipate and adequately prepare for exposure situations. Since this data spans a 10-year timeframe, it means that they have been at this same risky status quo for some time.

Compliance with and efficacy to Standard Precautions must be improved and may be achieved by more accurately measuring and quantifying exposures to target precautions and protection to specific situations, procedures or hospital location. Again, as we are now faced with emerging infectious disease threats, a scenario where 95% of all employees reporting into EPINet are not wearing masks or face shields when they experience a nose or mouth exposure is not acceptable.

There has been great focus in the infection prevention and control literature about the risks that patients face relative to their exposure to infectious microorganisms; however, the likelihood that they are sprayed and potentially infused with another patient’s blood or body fluid into their mucous membranes is extremely low. This is not to downplay the risk that patients face in regard to healthcare associated infections, as these risks are very serious and need to be addressed and prevented. It is to say, however, that healthcare associated infections cannot just be considered device-related or microorganism-related infections to patients. We must broaden the scope and thus the focus to infections or illnesses associated with microorganisms in the healthcare or hospital environment – this includes risks that healthcare workers and other allied professions face every day during their care of patients. These are extremely high risk exposures where infectious microorganisms can be potentially infused into the mucous membranes or non-intact skin of workers.

This intersection between healthcare worker and patient safety becomes more relevant when we can see that only 37% of workers experiencing a BBF exposure to the hands are wearing gloves. This poses a risk not just to the healthcare worker, but to the patient as well. The 37% compliance rate mimics overall hand hygiene/handwashing compliance in the published literature. We must not forget that gloves, as PPE, have a dual mechanism of protection - protect patient, protect self.

Risk is not just the intersection between those performing patient care with direct exposure to BBF, but also to those not in direct contact with patients but still exposed to BBF in the specimen, contaminated linen/laundry or waste streams. As such, the incidents reported into EPINet suggest that personnel who do not provide direct patient care are at risk of BBF exposure by being in proximity to patients or patient care. Some categories of personnel, especially speech, physical and occupational therapists and security guards, should receive routine in-service training in Standard Precautions, and be instructed to anticipate situations in which BBF contact may occur. We learned during the Ebola cases earlier last year that a patient may arrive to an emergency department feeling generally unwell with fever, aches and chills. It isn’t until potentially hours or days later that they have a laboratory-confirmed diagnosis, and in that time can have exposure to anyone in the cycle of transport from home/residence to waiting room, emergency care, clinical/medical assessment and diagnostics. In the unfortunate case of the Dallas Ebola patient, this could mean not just one cycle, but several.

**Recommendations for Action**

Occupational risk of BBF exposures continues to be a serious concern for those working in healthcare. Continued focus and study of this issue is recommended. The International Safety Center recognizes the value in partnering with other organizations also focusing on BBF surveillance, research and prevention, including OSHA, the National Institute for Occupational Safety and Health (NIOSH), the Centers for Disease Control and Prevention (CDC), the Association of Occupational Health Professionals in Healthcare (AOHP), and other policy, advocacy and professional organizations.

The data presented here indicate several areas where improvements are needed. EPINet data provide the basis for the following recommended actions:

1. **Engineering Controls:** Identify and improve medical devices and products that may act as vehicles of BBF exposures.
   a. Specimen and other body fluid containers should have closures that provide a tight, positive-locking seal, and should be resistant to breakage.
b. Equipment that pumps blood under pressure should have positive-locking junctions between connecting components, and should have pressure sensors linked to an alarm or pump cutoff or an equivalent safeguard to prevent high-pressure ruptures of tubing.

c. Reporting systems for healthcare worker exposures to BBF should explicitly identify products involved in exposures to assist with future product selection, more effectively communicate with product manufacturers, and improve understanding of product design features that best protect healthcare workers.

d. Consider newly available evidence-based technologies that may protect workers from exposures, to include advancements in safer design, alternate technical formulations, active barrier apparel and other protective controls.

2. Administrative and Work Practice Controls:
   a. Reduce to a minimum the amount of patient BBF handled by healthcare workers. The quantities of blood and urine collected for laboratory tests, for example, often exceed the amounts required for testing.

3. Personal Protective Equipment:
   a. Increase the availability and use of appropriate protective or barrier garments and PPE.
   b. Increase adherence or compliance with Standard Precautions, including the use of gloves. As handwashing and hand hygiene compliance increases due to more focus on preventing healthcare associated infections in patients, the skin on hands can potentially become non-intact or chaffed or cracked, creating greater risk.
   c. Increase the use of face shields and goggles, as contacts with the mucosa of eyes, nose and mouth are extremely high risk.
   d. Face protection should be used when there is the potential for splashing or spraying of body fluids, when restraining combative patients or patients in emergent situations, when in proximity to equipment that contains or pumps body fluid under pressure, and potentially when in proximity to intubation or extubation procedures.
   e. The use of loose-weave cotton or cotton-blend cloth lab coats in areas where contact with patient body fluids is possible should be discontinued. Outer wear and the emergence of literature related to the risk of apparel posing as a vector for transfer of microorganisms deserves a special note. Our findings illustrate that cloth lab coats provided no protective benefit since the same proportion of torso or arm exposures was reported in those who wore cloth lab coats as in those who wore no protective garment. The design of traditional lab coats is mismatched to the on-body distribution of BBF exposures. Lab coats are front opening and are frequently worn open; even when buttoned, the v-neck design leaves the upper torso unprotected. The open cuffs also leave forearms and wrists — common areas of BBF exposure — unprotected.
   f. The use of cover garments used as PPE (isolation or surgical gowns) made of liquid or fluid-resistant material and providing a continuous barrier in the front (i.e., not front-opening or v-neck) should be encouraged. Cover garments should have long sleeves and snug cuffs that overlap with gloves to provide adequate protection for the arms.
   g. Traditional non-protective lab coats are made of loose-weave cotton or cotton-polyester blends, fabrics that are not designed to be resistant to liquid penetration. Cotton is actually an absorbent material that wicks liquid through fabric, potentially increasing the amount of body fluid coming into direct contact with a healthcare worker’s skin. Manufacturers and standards setting organizations must address this issue through better design, safer technical parameters and new textile technologies.

4. Expand the standardized surveillance of healthcare worker exposures to BBF to further define the circumstances and mechanisms of exposures, determine the frequency and risk of occupational infection transmission under different exposure conditions and document the efficacy of specific prevention interventions.

References


Amber Hogan Mitchell, DrPH, MPH, CPH, is the International Safety Center’s President and Executive Director. The Center distributes the Exposure Prevention Information Network (EPINet®) to hospitals to measure occupational exposures to sharps injuries and other blood and body fluid exposures. Dr. Mitchell’s career has been focused on public health and occupational safety and health related to preventing infectious disease. She has worked in the uniformed services, public, private and academic sectors.

Ginger B. Parker, MBA, is the Center’s Vice President and Chief Information Officer. The Center distributes the Exposure Prevention Information Network (EPINet®) to hospitals and other healthcare facilities to measure occupational exposures to needlesticks, sharps injuries, and other blood and body fluid exposures. The Center envisions a future without occupational illness or infection.

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If you feel that AOHP has had a positive influence on your career, why not invite a colleague or other occupational health professional to join AOHP? AOHP membership brochures are available in print format and online at http://aohp.org/aohp/MEMBERSERVICES/HowtoJoin/DownloadBrochure.aspx. Contact AOHP Headquarters for a supply of brochures that you can use to introduce your colleagues to AOHP and invite them to join!

One & Only Campaign

The One & Only Campaign is currently being highlighted as an example of “Partnership in Action” on CDC’s National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) redesigned website. The Campaign is made possible by a CDC Foundation partnership with Eli Lilly and Company. The campaign communicates with healthcare providers about injection safety by disseminating materials through its growing network of 100+ organizations — a 200% increase in the number of collaborators in just one year. Nearly 100,000 campaign materials were distributed in 2014.

Together, NCEZID and its partners are able to accomplish more than any organization or institution can by working alone. For more information, please visit http://www.cdc.gov/ncezid. We encourage you to share this website with your colleagues and to follow us on social media. "Like" the One & Only Campaign on Facebook today and follow us on Twitter @InjectionSafety.
No Enigma: The Process of Hazard Identification, Assessment and Control in Healthcare

By Cory Worden, MS, CSHM, CSP, CHSP, ARM, REM, CESCO

When the Department of Labor and the Occupational Safety and Health Administration (OSHA) developed the Occupational Safety and Health Act of 1970, and it was subsequently implemented by then-President Richard Nixon, it was not a catch-all safety mechanism. Instead, it was and is a bare-minimum set of hazard control expectations, a laundry list of required assessments and controls necessary to ensure minimally safe conditions in the workplace. Reading between the lines, this means the government felt it necessary to issue directives for employers to: look at their employees’ work duties; acknowledge the hazards within an organization that could injure or sicken employees; and then implement equipment, processes or Personal Protective Equipment (PPE) so employees would have the tools, resources and training necessary to work safely. Later, healthcare-specific compliance measures from organizations such as The Joint Commission began referencing and even partnering with OSHA to further hardwire these safe conditions. Sadly, these developments provided evidence that, without definitive government interventions, industry leaders could not be expected to maintain safe work environments or practices. However, even with the last four decades of regulatory monitoring by OSHA, it’s important to note these regulatory compliance measures still only require safe conditions. For a true safety culture, compliance must be considered only a minimal level of safety; instead, these safe conditions must provide the foundation for safe behaviors. Furthermore, safe behaviors must come as the result of situational awareness and critical thinking to identify hazards so hazard controls can be used. In cases such as occupational disease exposures and workplace violence, failure to maintain situational awareness and use hazard controls will indefinitely lead to injuries or exposures whether the organization is compliant or not. Ultimately, claims of the “cost of doing business” or “there was nothing I could do about it” when injuries and exposures occur are only thinly veiled excuses for failures to assess situations and control hazards. There are no enigmas in safety; there is only hazard identification, assessment and control – or the failure to do so.

Hazard Analysis, Compliance, Conditions and Behaviors
Before any hazard controls can be implemented, and before employees can be expected to know safe behavior expectations, hazards must be analyzed. To do this, each department or classification must have a Job Task Analysis (Figure 1) that details what hazards exist in each task performed by employees in the department. With this, each department or classification can be assessed as to what hazards they face. Until these hazards for each department are known, there is no pretense for who needs to be subject to which hazard controls and, by effect, which regulatory compliance standards.

With each department’s Job Task Analysis complete and all hazards identified, the entire organization can now be stratified as to what hazards exist within each department. This will now allow for who is subject to what regulatory standard. For example, before the Respiratory Protection Program can be implemented, the organization needs to know which departments and, by effect, which employees, are at risk for aerosol transmitted disease exposures (such as TB) and/or chemicals. Furthermore, before the organization can know who is at risk for respiratory hazards from chemicals, each inventoried chemical’s Safety Data Sheet is needed to determine which chemicals are respiratory hazards. This Hazard Analysis is the keystone to any hazard control being successfully implemented (Figure 2).

Figure 1: Job Task Analysis

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Engagement

To avoid conducting this analysis in a vacuum with limited information, engagement with each department on their tasks and what hazards they face will not only provide a more robust information base for the Hazard Analysis, but also an opportunity for buy-in to build a common culture precedent in safe behavior expectations. With this Hazard Analysis complete, everyone from the organization’s departments to senior leadership will not only have a formally documented account of what hazards exist in their work areas, but they’ll have had an opportunity to develop it. This will provide the foundation of a safety culture.

Compliance, Controls and Conditions

With the Hazard Analysis complete, minimal compliance standards can be assessed. For example, those departments at risk for respiratory hazards are subject to 29 CFR 1910.134, the OSHA Respiratory Protection Standard. Those departments at risk for Bodily Fluid Exposures require PPE and are thus subject to 29 CFR 1910.132. These regulatory compliance standards provide safe conditions in that employers are required to provide employees mandatory tools, resources, plans and training for a safe working environment. Safe conditions can be considered minimally safe. Identification of hazards and at-risk personnel are required, and provisions are to be made to allow for safety. However, behaviors are entirely unaccounted for. To ensure safety, employers are required, often by law or national consensus standards, to provide and oversee the necessary programs for employees to work safely. This not only includes regulatory compliance but also hazard controls, according to the Hierarchy of Controls’

(Figure 2) enunciation of elimination over substitution, substitution over engineering controls, engineering control over administrative controls and administrative controls over PPE. Training, however, is required for any hazard control.

Without it, employees won’t know how to use the hazard control. Ultimately, employees must choose to use these hazard controls for true safety.
When at risk for a bodily fluid exposure, employees must choose to use the PPE provided by employers. When at risk for a patient handling injury, employees must choose to use the patient handling equipment provided by employers. These safe behavior expectations must be performance expectations in the same realm as arriving for work on time and following HR policies. Many hazards are identifiable, and safe work practices can be pre-planned. For example, when preparing to move a patient, the patient can be assessed to determine what equipment is needed to safely perform the task. If a catheter is to be removed, the possibility of a bodily fluid exposure can be assessed and PPE can be donned before beginning the task. When working with hazards that are identifiable, the Job Safety Analysis model developed by OSHA provides a perfect cue for this.

While the OSHA Job Safety Analysis model is a multi-page template, the L-I-F-E model works equally well:

With this, should a hazard control not be available or accessible, the employee has a perfect opportunity to initiate a conversation with his or her supervisor, those required to provide these hazard controls. However, should the employee not identify a hazard or choose not to find a hazard, this would be a performance failure. This may sound harsh, but, unfortunately, is the only logical way to view this situation. Provided an employee has been trained on the task and the hazard, and provided training with the expectation to use hazard controls, if any employee fails to identify the hazard and not work safely by using the hazard controls, this is the same situation as if the employee failed to arrive for work on time. Unfortunately, the potential consequences are much more severe for the employee; while HR might issue correct actions to employees, failure to work safely could kill them.

**Dual Accountability**

Dual accountability is very necessary in hazard control (Figure 5). Expectations must be set for safe behaviors using hazard controls, and employees must be provided the necessary tools, resources and training to achieve them. Employers quick to blame employees for failures to perform safely won’t be given a pass from OSHA for workplace injuries. In addition to ensuring safe conditions, employers are required to oversee employee performance to ensure safe work practices. Additionally, no amount of buck-passing will change the fact that an employee(s) was injured or exposed. Attempting to skirt accountability for these managerial failures will only allow continued unsafe behaviors and potentially alienate employees, a matter that could lead to increased turnover and future reporting lapses, resulting in patient safety, infection control or countless other issues. Simultaneously, employees who seek to blame employers for their own unsafe behaviors are failing to understand that, ultimately, they own the consequences of unsafe behavior. If a hazard control isn’t available, employees need to say so for employers to realize work cannot be accomplished without them. If employees continue to work unsafely, employers will not feel the shortfall in productivity and will continue to expect the same rates of productivity. Should employees work unsafely and become injured or exposed, while employers are responsible for workers’ compensation, they aren’t the ones on lost time, restricted or transitional duty, facing possible losses of careers or even death. Both employers and employees have parts to play in employee safety. Until all parties realize this and work as a team, fingers will continue being pointed at each other.

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**Figure 4: The L-I-F-E Model**

| L – Look for Hazards (ex. – Patient Handling, Needles, Slipping Hazards, Tripping Hazards, Workplace Violence potential, Heavy Objects, other.....) | Loose cords, wet floors, pulled-up carpet |
| I – Is it Risky? Risk = Frequency of Hazard x Severity of Hazard (ex. – Patient Handling occurs frequently and can have very severe injuries associated with it – with this, it is a High Risk task) | I walk through the area every day and could slip or trip and fall and seriously injure myself. This could be a medium to high risk. |
| F – Find a Hazard Control (ex. – Equipment, devices/guards, awareness, process, procedures, assistance, PPE, training, education, other.....) | I can tie up the loose cords below my desk and put a cover over the loose cords on the floor. I can mop up the wet floor or display a “wet floor” sign and report it to EVS. I can mark the pulled-up carpet and report it to the Facilities Engineering Department. |
| E – Execute Safely! Use hazard controls, make a plan, and choose to work safely and avoid injuries Think Safety - Avoid Rushing, Fatigue, Frustration and Complacency | I’ll pay attention to where I’m going and what’s in my path as I walk. I’ll ensure to get enough sleep to avoid fatigue. I’ll ensure to wear appropriate footwear to avoid slips and trips and will watch out for anything that can hit me or I can run into. |
Situational Awareness

In healthcare, a common scenario unfolds in which multiple employees are exposed to a communicable disease, and the situation is excused as "the cost of doing business". In other situations, an employee(s) is attacked by a patient, visitor or even another employee; these situations have also been known to be excused with, "it just happened". In yet other cases, employees have been performing seemingly routine tasks when they were splashed with a potentially infectious material or stuck with a contaminated needle. In any case, however, continual process improvement is needed for not only hazard control development but also in personal situational awareness to identify hazardous situations and to maintain positive control of the situation to avoid an injury or exposure. To put this in perspective, excusing these injuries and exposures as "the cost of doing business" would be the same as a police officer or a soldier being injured by an assailant and their leaders excusing it as "it just happened".

These organizations train for situational awareness and hardwire identification and reactionary procedures to respond to hazardous situations as they arise. The U.S. Army’s Battle Drill #4 in the Expert Infantryman’s Badge study guide is the React to Ambush drill – this is a hardwired procedure soldiers follow when confronted with an enemy ambush. The Army does not, however, sustain casualties after an ambush and pass it off as "the cost of doing business". Each incident is followed with a comprehensive review with the expectation that learning will take place to prevent future incidents.

The OODA Loop

A theory used in military units, law enforcement and emergency management to maintain situational awareness and determine courses of action to mitigate hazardous situations is the Observe-Orient-Decide-Act (OODA) Loop. The OODA Loop, created by U.S. Air Force Colonel John Boyd for application during aerial combat, allows users to observe situations for indicators of emerging events, orient themselves to their positions in relation to their opponents or hazards, decide on an appropriate course of action and act accordingly to avoid the hazardous situation. In the case of Colonel Boyd’s application, his original intent was to observe for enemy fighter aircraft, orient to their position, decide on a course of action to out-maneuver them and act to defeat them. This not only allows the user to defeat the enemy in combat, but to do so by thinking ahead of an enemy who is reactively responding to the user’s movement. By proactively thinking ahead in observing and orienting to enemies, the user can predict their movements and defeat them. This theory and model was later incorporated into ground combat applications, first by the U.S. Marine Corps and later by the U.S. Army, to "get inside the enemy’s OODA Loop and not let them inside [ours]". With this, more elaborate uses of the OODA Loop emerged, with orientation becoming a more robust effort by taking...
into account enemy culture and other external variables influencing the fight. Later, expounding on this application, the OODA Loop became a fixture in emergency management through uses in proactively preventing and mitigating terrorism.

**The OODA Loop in Safety**

To proactively identify and address hazards, namely those that are patient-borne, such as infectious diseases, workplace violence, patient movements causing needlesticks and more, the OODA Loop can be applied to this purpose. To do this, the main delineation from its traditional combat-centric uses is that the user will be, instead of observing and orienting to an enemy combatant, observing a situation and orienting to possibilities of disease exposures, workplace violence, patient movements or other causal factors of workplace injuries or exposures. By observing for hazards, orienting to them (for example, ensuring the patient doesn’t block the route of egress, such as the door, and maintaining reactionary distance), determining a course of action (such as proactive use of hazard controls, calling a code/security, donning PPE, requesting assistance or others) and acting accordingly, the OODA Loop user can condition and train him or herself to actively look for hazards and proactive follow pre-determined safe work practices to avoid injuries and exposures.

**Healthcare Safety in a Volatile Environment**

Ultimately, healthcare is, will be, and always has been a volatile environment. Hazards are plentiful in the healthcare workplace. However, hazard control is not an enigma. It isn’t a mystery. It is, however, a process of proactively identifying hazards; implementing mandatory regulatory compliance measures; implementing best practice hazard controls as performance expectations as well as training and conditioning our teammates for them. With this, they can not only choose to follow safe work practices using hazard controls, but actively observe environments for hazards and threats, orient themselves to avoid dangerous situations and determine hazard controls and risk practices, and act accordingly. Dual accountability is necessary. Leaders must be vigilant to analyze employee tasks to determine hazard exposures and to provide hazard controls and training. Employees must know these hazards and ensure to utilize the hazard controls while following safe work expectations. Leaders must expect continual process improvement in observing for and proactively mitigating hazards as opposed to accepting them as "costs of doing business". Nothing is a mystery. Healthcare has years of loss experience in terms of workplace injuries, including fatal disease conversions and acts of workplace violence. Until the industry adapts to understand how these hazards manifest and how to respond to them in the same manner that a soldier reacts to an ambush, the industry will remain complacent. Now is the time for change.
Figure 7: Hazard Control and Dual Accountability Model

What it takes to control a workplace hazard.....

Best

* Use of Hazard Controls
* Avoidance of Dangerous States of Mind
* Avoidance of the Four Critical Errors
* Engagement, Observations & inspections

Better

* Implementation of Hazard Controls
  (in order of precedence)
  - Hazard Elimination
  - Hazard Substitution
  - Engineering Controls
  - Administrative Controls
  - Personal Protective Equipment
* Training provided for all hazard controls as parts of the integrated work process

Basic

* Legal Requirements
* Specific hazard areas have specific regulations that are required by federal
  Department of Labor/OSHA law
  (examples – Respiratory Protection, Bloodborne Pathogens, PPE, HAZCOM and more)

* Hazard areas that don’t have specific regulations are required to be
  controlled by the General Duty Clause; these hazard controls can be
  determined by the Hierarchy of Controls

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