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Like a Loaded Gun

Preventing Needlesticks & Sharps Injuries

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In the world of healthcare, the adage is often used: Handle a needle or sharp like a loaded gun. Needlesticks and sharps injuries that lead to bloodborne pathogen exposures are common. These injuries contribute to the healthcare industry average 6.2 per 100 employees recordable injury rate (BLS, 2014), not only with each needlestick or sharps injury being a 50/50 chance of a communicable disease exposure but also with each contaminated exposure being an instant OSHA-recordable injury (OSHA, 2016b). Even if needlesticks or sharps injury outcomes do not ultimately lead to disease transmission or heightened treatment costs, they still lead to time spent on assessments and laboratory testing, as well as the psychological and emotional distress experienced while waiting to learn whether disease transmission will occur.

In terms of hazard control, healthcare in general is a more volatile and challenging industry than many others. Law enforcement and fire protection are comparable in terms of real-time decision making and the extrinsic variables that contribute to injuries and exposures. Healthcare requires not only diligence in hazard control implementation and training, but also situational awareness and conditioning to ensure that those hazard controls are used at the right times and places.

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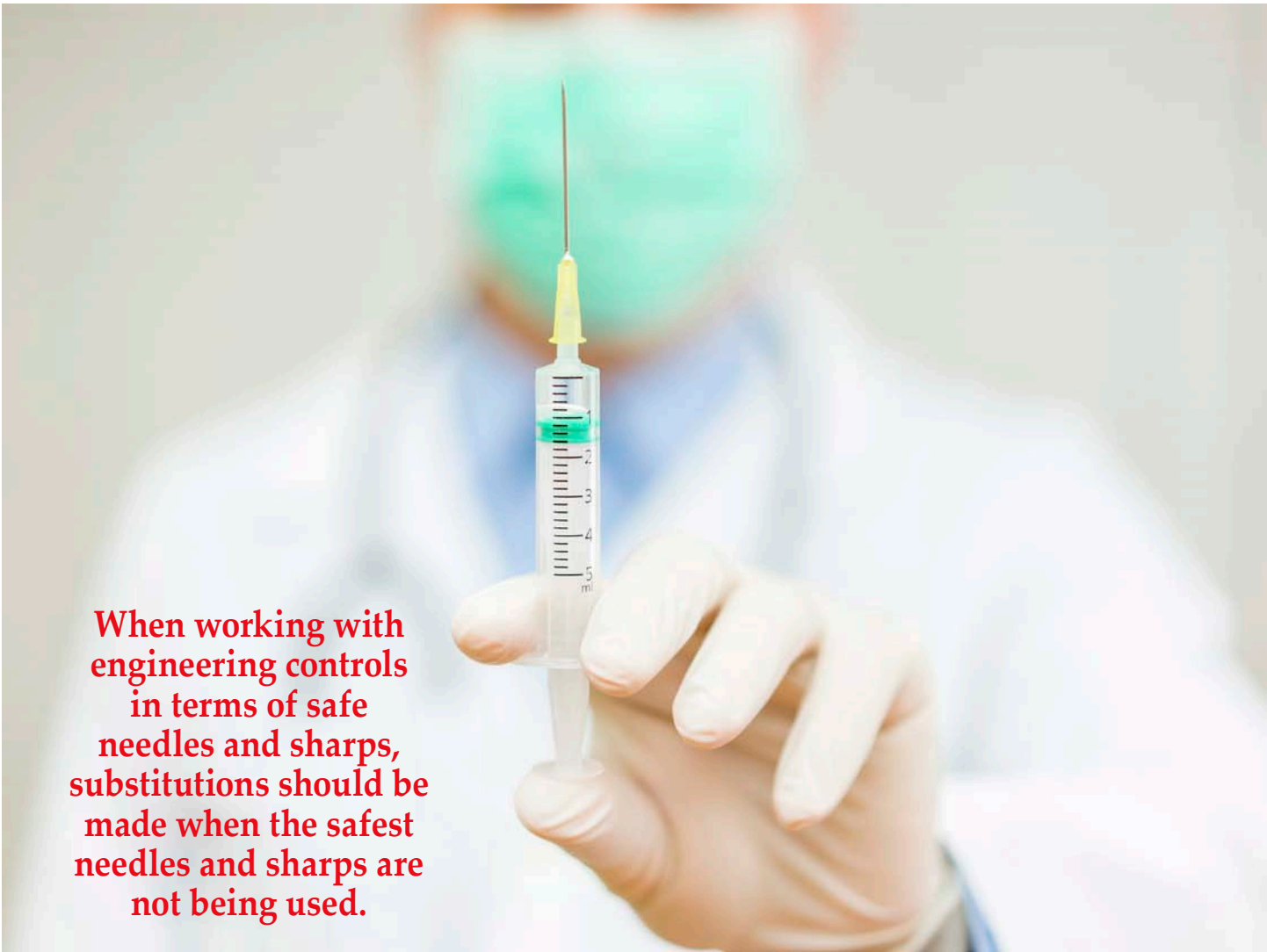
For example, it is one thing to have the safest possible needle and to know how to use it, but can the employee assess the patient's status in a real-time setting to determine whether s/he needs assistance? Is the patient intoxicated? Is the patient combative? Is medical management needed? If these and other conditions are not assessed in real time, it will not matter whether the employee knows how to use the needle and can perform the procedure because it will not be safe to do so in the first place.

Quality & Safety Education in Nursing
American Association of Colleges of Nursing (AACN) and **Robert Wood Johnson Foundation** have led nursing education in developing competencies in safety through the

Quality and Safety Education for Nurses (QSEN) project. The competencies include addressing the knowledge, skills and attitudes to provide safe, patient-centered care that is effective, high quality and error free (AACN, 2016).

Safety competencies involve preventing errors and injuries with a goal of zero occurrences. Safety involves assessing the environment, patient, equipment and staff with a mind-set on prevention, including the need for hazard control and situational awareness (Sherwood & Zomorodi, 2014). Quality competencies are similar to safety competencies by focusing





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on compliance with standardized processes, which are validated as evidence-based practices for achieving specified standards. The patient-centered care mindset includes teamwork and collaboration (Sherwood & Zomorodi, 2014).

The QSEN mind-set applies to injury prevention in the workforce as well as to patient care. The five components in the hierarchy for hazard control provide a standardized process for preventing injuries. They are readily applied to reducing exposures to communicable diseases through needlestick and sharps injuries. With such a situation, the hierarchy of controls can be used to guide safety practices and teach strategies for embedding QSEN competencies into colleague learning and conditioning.

Hazard Control

1) Hazard elimination. When working with patients and potential bloodborne pathogens, the hazard can rarely be eliminated. However, the medication reconciliation review and collaboration among team members

are opportunities to reflect on the need for injections and alternative means for meeting patients' needs with less risk to the care providers.

For educating colleagues to reflect on hazard elimination, a doorway assessment exercise is a method for promoting stop-think-act-review (STAR) of a situation in which an injection or use of a sharp would be involved. The doorway assessment includes setting up a hazardous scenario and having participants stand at the doorway to observe and identify hazards and options for eliminating or controlling hazards (Altmiller, 2016). In real-life situations, a doorway assessment and one-minute safety check can be used to quickly assess a situation and prioritize safety concerns.

2) Hazard substitution. As with hazard elimination, patients cannot be substituted. However, when working with engineering controls in terms of safe needles and sharps, substitutions should be made when the safest needles and sharps are not being used. The doorway

assessment exercise can be expanded to include asking participants to propose ways to substitute safer equipment to reduce hazards.

3) Engineering controls. The safest possible needles and sharps should be used. Many guidelines for these efforts exist including the Safe in Common's (2013) golden rules of safety and guidance within OSHA's Blood-borne Pathogen standard. When reviewing the golden rules of safety with a team, the educator can instruct groups of four to six participants to reflect on the rules and ask them to discuss how they can do their jobs better. Ideas can be recorded on flip charts or white boards, then shared with the group (Altmiller, 2016). This exercise can have a big impact for a multidisciplinary team in which members have varied backgrounds and perspectives that make for a rich sharing of ideas.

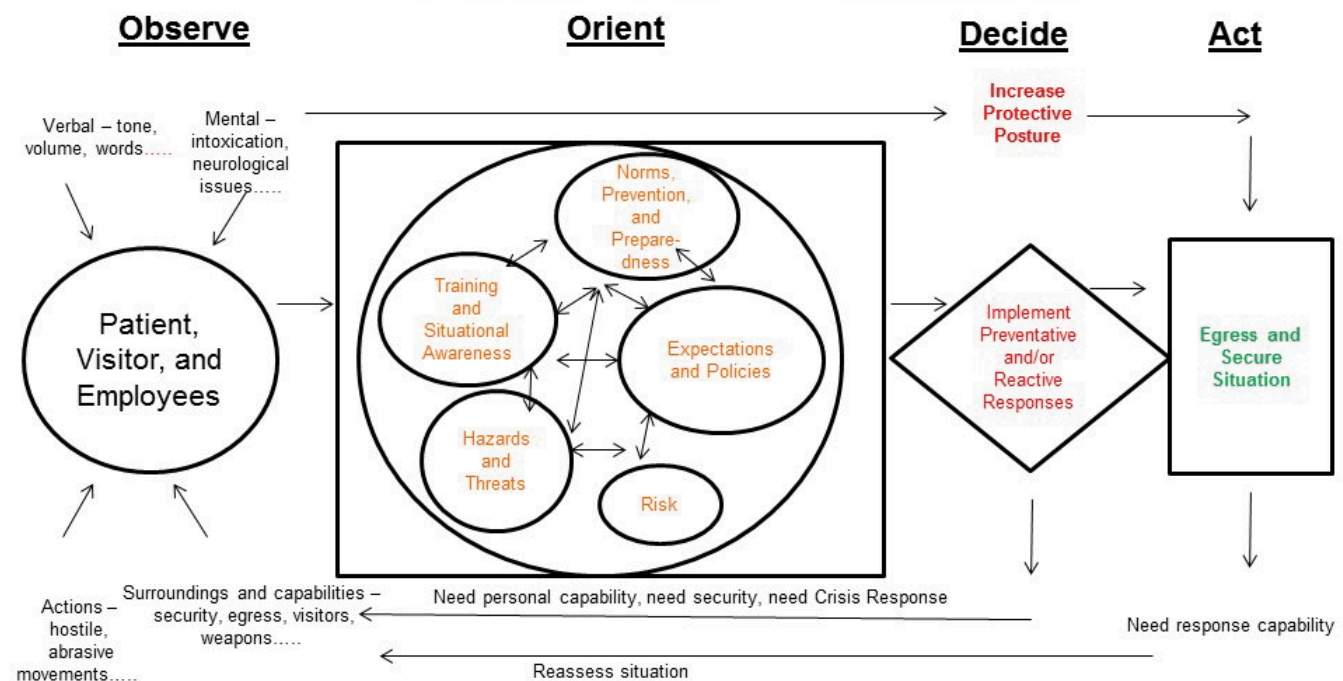
4) Administrative controls. With the safest possible devices in place, the safest possible procedures should be developed for all processes and procedures using needles and sharps, such as drawing blood and starting an IV. With these safe processes and procedures developed, each employee must be trained to perform them to standard. Once trained, reinforcement and accountability are important measures to promote compliance with the safe processes. Observing employees in the performance of the processes, and recording and sharing the

results can be powerful tools for motivating employees to use safe practices. Having a unit bulletin board that shows the percent compliance and discussing results in staff meetings will help promote teamwork and peer pressure toward safety (Sherwood & Zomorodi, 2014).

5) PPE. Even with the safest possible devices and procedures, PPE must be diligently used. Any time the possibility of an exposure exists, PPE should be used. This includes hand, eye, face and other protection. To promote PPE use, equipment must be made available, convenient and accessible to employees. If PPE is difficult to find, does not fit well, is out of stock or has other difficulties in its use, it will not be used.

Furthermore, all employees must be trained on how and when to use PPE. Patient-centered care, which recognizes the patient and family as full partners in healthcare, establishes a mind-set for advocacy. Teaching patients and family members to speak up to healthcare providers to use PPE provides a sense of control to the patient and family, as well as promotes use of PPE among providers. Fostering open communication, teamwork and collaboration provides the supportive culture in which safety is encouraged. Developing team members' abilities to give and receive feedback promotes mutual respect so that employees will feel free to ask for help with PPE and remind each other of its proper use (Altmiller, 2015).

FIGURE 1
Observe-Orient-Decide-Act Loop



Source: Coram, 2002

Situational Awareness & Conditioning

To maintain situational awareness, John Boyd's observe-orient-decide-act (OODA) loop can be used (Figure 1, p. 3) (Coram, 2002). With hazard controls in place, employees must know not only how to use them, but also, just as importantly, when to use them. With healthcare's array of variables in terms of patient conditions, emergent situations and more, employees must be able to assess situations in real time to not only respond to the situation but also to do so safely using their safety behavior expectations. Should employees not be able to identify hazardous situations, it will not matter how well the employee can use the needle or sharp, s/he may still be injured.

Observation is the first element in creating situational awareness. Before making any decision, the complete situation must be fully understood. The information gathered in this phase of decision making includes raw data that must be processed. Combative or intoxicated patients, bystanders, distractions in the environment and patient tone can be used to determine how a patient will respond to a needle.

Orientation includes how individuals view their observations based on personal norms, training, life experiences, risk perception and policies. In healthcare, policies, training and risk assessments must be in place surrounding needlestick procedures. These factors, coupled with personal norms and life experiences, will help orient nurses toward a proactive mind-set regarding their decision.

Decision is the third phase in the OODA loop. A decision should be made after consideration of all factors. Nurses must decide what type of equipment is needed, whether extra personnel are required and timing of the action.

Acting on the decision is the final step. This involves the nurse physically performing an action to implement the desired decision. Part of the action is the follow-up. Did the action go as planned? If not, feedback must circle back into the process to determine how the desired action can occur in the future.

If a loaded gun malfunctions, the user would troubleshoot the weapon to determine the cause of failure. This is done with extreme care and caution. If the gun is broken, the user does not trust the weapon because it could fire without the user triggering the action. This same distrust occurs with needlesticks. The nurse may have followed all procedures and policies, but the situation may still result in some factor leading to a needlestick. The feedback loop is in place for the process to correct its malfunction.

To condition employees to assess situations with the use of Boyd's OODA loop before moving into actions and implementing skilled care, educators can engage learners in reverse brainstorming. A case study can be

analyzed by having the participants consider the best way to injure themselves and others in a given scenario (Altmiller, 2016). Reverse brainstorming allows employees to practice situational assessment in a fun way that is readily transferrable to real-life scenarios.

Like a Loaded Gun

With hazard controls in place and employees conditioned to maintain situational awareness, another set of expectations can be used to maintain safety with needles and sharps. Using the loaded-gun adage, why not refer to the tried-and-true gun safety rules used by the National Rifle Association (NRA, 2016) and U.S. military? The simple yet effective gun safety rules can also be applied to needles and sharps:

"Always keep the gun pointed in a safe direction" (NRA, 2016). With needles and sharps, this is a fundamental safety rule. Needles must be kept in a safe direction before and during their use, and while being transported to the conveniently placed and accessible sharps disposal container. In the operating room or other procedural areas, neutral zones or safe zones must be used to avoid needlesticks while transferring instruments between users. Needles must not be recapped (with exceptions). Ultimately, if the needle is not pointed at someone, there is less chance for injury.

"Always keep your finger off the trigger until you are ready to shoot" (NRA, 2016). Needles and sharps must be kept safe/capped until absolutely ready for use (although not contaminated and normally not OSHA-recordable, clean sticks are still not a good thing), used with extreme diligence to avoid rushing and other factors that lead to injuries. Furthermore, needles must be diligently and safely moved to an appropriate disposal container or other placement area after use.

"Always keep the gun unloaded until ready to use" (NRA, 2016). Needles must not be opened (again, clean sticks are not good even when not contaminated or OSHA-recordable) until ready for use and must be rendered safe with the appropriate safeguard immediately after use. Needles must not be passed without using neutral zones, safeguards, verbal cues or other measures to ensure no exposures. Finally, needles must be disposed of or stored after use without unnecessary handling.

Just as a weapon must be kept unloaded and with the safety engaged, needles must not be unnecessarily handled before or after use, especially when contaminated. This only increases the chances of an exposure.

"Know the target and what is beyond" (NRA, 2016). Many needlesticks occur while using subcutaneous autoinjectors. This can occur when the needle transfers through the patient's skin and into the healthcare worker's finger or hand. However, if the healthcare worker's

hand was not on the opposite side of the needle, the needle would not have stuck him/her.

“Know how to use the gun safely” (NRA, 2016). Aside from avoiding rushing, fatigue, frustration and complacency, Wilson and Higbee’s (2012) “dangerous states of mind,” having appropriate, applicable training on each device being used and each procedure being performed is fundamental to needle and sharp safety. Without basic training, safely using the devices in real time with real patient variables is almost impossible. The training needs to include instruction on safe use as well as practice and demonstration of competency in the use of each piece of equipment.

“Be sure the gun is safe to operate” (NRA, 2016). Just as having training on each device is fundamental to safety, having the safest possible devices is also paramount to safely using needles and sharps. Devices without safety mechanisms or equally safe procedures should be evaluated with ever-safer devices being utilized. This is not only good for safety but also defined by OSHA as part of the sharps log process (OSHA, 2016a).

“Wear eye and ear protection as appropriate” (NRA, 2016). While eye and ear protection certainly apply to guns, all healthcare workers must diligently use PPE whenever a chance of an exposure exists. This includes eye, face and hand protection as well as clothing covers and other PPE as needed. PPE can mean the difference between a safe procedure and a life-altering exposure to a bloodborne pathogen or bodily fluid.

Other gun safety rules applied by NRA (2016) and other agencies should be noted as applicable to needle and sharps safety. Rules such as never operating under

the influence of drugs or alcohol are applicable to safety of all varieties. With safe devices, QSEN training and awareness of human factors and human errors, this danger can be mitigated.

Human Factors

Other human factors are applicable to gun safety and can contribute to needlesticks in the healthcare environment. In their recent study, Ersin, Koruk and Yilmaz (2016) interviewed 144 nurses to uncover the root cause of needlesticks in their environment. Respectively, “understaffing, patient density, long working hours and time constraints led to the majority of needlestick injuries” (p. 563). Just like a loaded gun, a needle cannot be handled while working extensive hours or while rushing to complete a job. These issues stem from systemic industry-wide contributing factors to needlestick injuries in healthcare.

Fatigue can be a common occurrence in the healthcare industry. Healthcare is a 24/7 environment and prolonged periods of shiftwork interrupt the circadian rhythm. Research popular in the aviation industry (Hawkins, 1987) shows objective evidence of slowed reaction and decision-making times, errors in judgment, and the tendency to accept lower standards of operational performance. Fatigue does not always occur from excessive physical labor, but rather it is associated with “disturbed or displaced biological rhythms” (Hawkins, 1987, p. 57). Referring to the OODA loop model, these fatigue factors directly impact the decision for nurses to make when using a needle. Also, they may be willing to accept a lower standard while fatigued or rushing to complete a job.



Strategies to prevent fatigue in healthcare are similar to those found in law enforcement, fire protection and aviation. All fields involve critical, life-changing decisions. Long working hours and staffing shortages are two common burnout factors of nurses (Lachman, 2016), but other physical and psychological components can affect nurses just as with law enforcement or firefighters. Guilt, traumatic stress and compassion lead to physical exhaustion and fatigue (Lachman, 2016). Finally, patient satisfaction and safety are negatively correlated with fatigue (Lachman, 2016). Workplace strategies must be in place to avoid injuries as well as ethical complications to patient care.

Referring to the hierarchy of controls, individual and organizational administrative controls can help reduce fatigue in healthcare. Hospital leadership is directly linked to high levels of nurse satisfaction (Lachman, 2016). Another link to nurse satisfaction is the culture. Healthcare provides services to society that should promote a caring culture, which should include internal culture as well. Hospital administrations that respond to concerns of staff and that work collaboratively to resolve issues have higher satisfaction scores (Lachman, 2016). Administrative controls should be in place to promote a caring culture, high satisfaction of nursing staff and motivating performance management for staff. These controls will help decrease fatigue, increase situational awareness, and improve safety and patient satisfaction in healthcare.

Ultimately, the loaded gun comparison is used widely in healthcare regarding needles and sharps because without vigilance and diligence to safety procedures, both can kill the user or those around them. Guns may do so more quickly and violently, but needles and sharps can just as certainly kill. They must be handled with the same diligence as that of guns. This danger can be mitigated with the use of safe devices, training and awareness of human factors, and human errors. Finally, while using the loaded gun comparison, basic gun safety rules can be applied to make the point clear. Needles can kill; it is up to the user to prevent these injuries. ■

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