



Lessons Learned & Success Stories – December 2017 to February 2018 Report

The NBACC Mishaps, Lessons Learned and Success Stories Summary serves to reinforce a strong culture of safety and accountability by promoting consistent reporting of mishaps, establishing strong lines of communication with the safety department, supporting a learning environment by allowing others to learn from reported events, and tangibly demonstrating NBACC Leadership's commitment to safety, accident prevention, and continuous improvement.

SUCCESS STORIES:

1. A staff member noticed a small puddle of water forming under the hot water faucet on the coffee machine. They immediately cleaned it up with paper towels to prevent a slip or fall. They went further to investigate why the faucet was leaking and discovered that the faucet handle had not been pushed down the whole way which was causing the drip.
2. A tabletop drill was conducted to exercise the potential occupational exposure response algorithm with SCSU. The scenario involved an animal bite. While the potential exposure was regarding a select agent virus in the scenario, the drill was designed to present a possible concurrent Herpes-B virus exposure. A suggestion was made to keep Valacyclovir (post exposure prophylaxis for Herpes B exposure) on hand in the Competent Medical Authority (CMA) office so that a rapid response could be administered in that situation. The medication has been received and is stored with the CMA. This represents a simple yet effective process improvement in caring for an employee who has been exposed or potentially exposed to the B virus. Comparative Medicine staff and the Attending Veterinarian were very appreciative of the decision to keep this medication in house.
3. With the requirement of secondary containment/respiratory protection, there was a need to identify a way to culture treated cells while maintaining two layers of protection without using a Powered Air Purifying Respirator (PAPR). Two staff members came up with the idea to use gas permeable bags that are used regularly for bacterial plate culturing to culture treated mammalian cells in tissue culture. The gas permeable bags allow sufficient air flow and gas exchange to facilitate cell culturing, and provide a second layer of protection. This method eliminates the need for PAPR requirements (in the room or when the incubator is open) during incubation or plate retrieval from the incubator for toxin or BSL-3 viruses. A maximum of 6 plates can be put in a standard bacterial gas permeable bag. If a deli tray and larger bags are used, many plates can be efficiently incubated without having to don a PAPR.
4. On routine inspection, Facilities Management Office (FMO) personnel noticed an ABSL-3 room drain trap containing animal fecal waste and immediately notified the Comparative Medicine (CM) lead. CM staff and FMO staff met in the interstitial space to observe and assess the problem and brainstorm possible solutions. A consensus was reached that a modification to CM's current drain flushing technique could potentially solve the problem. CM and FMO coordinated a time later in that day where the solution could be tested in real time while CM and FMO staff were observing the drain. The technique modification quickly resolved the issue. The following day CM staff had FMO

staff observe all potentially affected drains that had been flushed with this new method and verified that the modification was effective in all cases. CM SOPs and forms are being updated to include the successful modification. This resolution represents BNBI's commitment to continual process improvement and prevented a potentially more complicated outcome.

5. A forensics project required the use of a new piece of equipment in the BSL-4. Safety had some concern about the size of the equipment and placement in the Biological Safety Cabinet (BSC) affecting airflow or the ability to conduct work. Staff consulted with a member of the threat group and was able to determine that a precedence had already been established for using comparable equipment in a BSL-3 laboratory in the BSC. The new equipment was setup in the lab, Safety was able to quickly assess and determine that all criteria were acceptable. This success story reduced time that might have otherwise been lost by utilizing and taking advantage of available resources.

LESSONS LEARNED:

1. With the winter months upon us, the air is dry and cuts are more likely. Use caution when opening boxes and be aware of sharp edges. Report any areas that could cause potential cuts as there may be solutions to prevent injury. Ensuring you hydrate and moisturize will also help prevent skin cracks.
2. The integrated gloves that are used on the BSL-4 environmental suits are required to be changed every month regardless of the amount of time a suit is used for two reasons. The first reason is that many of the BSL-4 environmental suits are shared between staff of a similar size, and it is not possible to monitor the type or the amount of work (insults) to which a glove is subjected. The second reason is that the neoprene material of the gloves will degrade over time and it is simply much safer to change the gloves out every month as a way to prevent their failure.
3. Room signs are the final administrative control that informs staff about the hazards that are in a laboratory or animal room, as well as the Personal Protective Equipment (PPE) that is required to safely enter and work in the room. If someone tells you that "it is fine to enter that room", staff are still required to read and obey the posted room sign. In addition to training, reading the room sign is the last line of defense in preventing an unintended potential exposure from entering a laboratory without proper PPE.

After review of near misses involving respiratory protection and the correct documentation of a toxin spill, the following clarifications were developed to help staff understand process requirements:

4. Only authorized personnel can train employees or subcontractors on the OSHA required elements in various NBACC safety programs, such as fall protection program, the laser safety program, and lock out tag out program and the respiratory protection program. Training in OSHA safety programs must be conducted by a person who, by education, or experience, is deemed competent in that subject area. That usually means that the trainer has some formal education in the OSHA program (a degree, course of study or a 40 hour class). At NBACC, only the Respiratory Protection Program Administrator can train staff in the use, and maintenance of respiratory protection equipment.
5. Wearing a PAPR does not excuse one from following NBACC's established spill response procedure. Whenever a spill occurs, especially outside of containment, staff must report it to Safety by calling 3-5767. An email is NOT sufficient; sending a near miss form without prior notification is also not acceptable. By quickly reporting the spill to Safety, they can notify the CMA and Responsible Official (RO), who will assess additional impacts. The CMA wants to know about potential exposures even if staff were wearing PAPRs. It is the CMA's responsibility to assess the risk of exposure for ANY type of spill of toxic or infectious material.
6. All CDC Principal Investigators (PI) are registered for select toxins, which means that a spill of toxin in *any amount* outside of containment is reportable as a Form 3 to CDC DSAT. (There are no exempt quantities

of toxins for CDC registered Pls.) In addition, the RO will need to determine if there was a spill of agent outside of containment, and will notify the CDC immediately, as this is a Form 3 regardless of whether staff were wearing PAPRs or not.

7. Be cautious when placing hands on unfamiliar objects. There have been multiple hand injuries due to contact with sharp metal objects. When retrieving an object or opening/closing doors, always make sure you are aware of what you will be touching.
8. Don't assume that proper PPE eliminates the need to maintain caution when conducting activities. Despite the fact that an individual was wearing safety glasses, they were still able to splash bleach in their eyes.

EVENT SUMMARIES:

1. **FIRST AID SUMMARY:** 11/08/2017; A staff member scraped the top of their head on an animal cage while working in the ABSL-3. The CMA applied first aid, ruled no potential exposure, and placed the staff member on modified duty.
2. **OSHA RECORDABLE SUMMARY:** 11/20/2017; A staff member cut their finger on the metal edge of a cabinet door in a non-containment buffer corridor. They were attempting to catch a pile of scrubs as they fell out of the cabinet. The CMA applied four (4) sutures to the wound and the staff member was restricted from all lab work for 13 days. Within a few hours of this incident, facilities staff removed the metal plates from the cabinets in order to prevent this from occurring again.
3. **FIRST AID SUMMARY:** 11/21/2017; A staff member cut their finger on a cardboard box while working in an industrial area. The CMA applied first aid and placed the staff member on a modified duty.
4. **FIRST AID SUMMARY:** 11/22/2017; A staff member sustained a skin abrasion when they scraped their finger on the floor while unplugging a floor cleaning machine. The CMA applied first aid and placed the staff member on a modified duty. Staff were reminded to wear work gloves for these types of operations.
5. **FIRST AID SUMMARY:** 12/14/2017; A staff member scraped the back of their hand with their thumbnail while donning gloves in the BSL-3. The CMA applied first aid and ruled no potential exposure. The staff member was placed on modified duty.
6. **FIRST AID SUMMARY:** 01/02/2018; A staff member scraped the back of their hand on the sharp metal edge of a shelf in a BSL-2 laboratory. The CMA applied first aid and the staff member was placed on modified duty.
7. **OSHA RECORDABLE INJURY:** 01/02/2018; A staff member struck their hand on a metal locker in a BSL-3 change room and cut their finger. The CMA applied first aid and the staff member was restricted from the lab for two days.
8. **FIRST AID SUMMARY:** 01/02/2018; A staff member scraped their finger on a screw while changing filters in an industrial area. The staff member was wearing gloves. The CMA applied first aid and the staff member was placed on modified duty.

9. **OSHA RECORDABLE INJURY:** 01/03/2018; A staff member noticed that their hand was bleeding from a scrape in a BSL-3 laboratory, however they did not remember the cause of the injury. The CMA applied first aid and the staff member was restricted from the lab for one day.
10. **FIRST AID SUMMARY:** 01/04/2018; A staff member sustained a splash of bleach in their eye while making a disinfectant solution in a BSL-3 laboratory. The staff member was wearing safety glasses at the time. They rinsed their eye for approximately five minutes at the eye wash and then reported the incident to the CMA who informed the staff member to rinse the eye with saline solution and report to the Occupational Health Clinic. The CMA evaluated the injury and released the staff member back to work.
11. **FIRST AID SUMMARY:** 01/11/2018; A staff member sustained a bleeding cut when a hangnail caught and ripped when they were tying their shoelaces in a BSL-3 change room. The CMA applied first aid, ruled no potential exposure, and the staff member was placed on modified duty.

NEAR MISS SUMMARIES:

12. **PPE FAILURE SUMMARY:** 11/14/2017; A staff member reported an outer glove tear (nitrile) while performing an inventory check in a BSL-3 laboratory. The CMA ruled no potential exposure.
13. **PROCEDURAL FAILURE SUMMARY:** 11/22/2017; A staff member reported that they had mistakenly entered BSL-3 containment with a partially scabbed over cut on their leg. CMA ruled no potential exposure.
14. **PROCEDURAL FAILURE SUMMARY:** 11/22/2017; A staff member entered an ABSL-3 room without PPE. The CMA ruled no potential exposure, and the staff member was reminded to read signage prior to entering any laboratory or animal room.
15. **PPE FAILURE SUMMARY:** 11/29/2017; A staff member reported a large (4 inch) tear in their outer glove (AlphaTek®) while working in BSL-4. The cause of the tear is unknown. The inner glove remained intact and there were no spills of infectious material while they were working in the suite. The CMA ruled no potential exposure.
16. **PPE FAILURE SUMMARY:** 12/04/2017; A staff member reported an inner glove tear (nitrile) while working with non-infectious material in a BSL-3 laboratory. The CMA ruled no potential exposure.
17. **SPILL SUMMARY:** 12/15/2017; A staff member reported that a small amount of media containing a Risk Group (RG) 2 select toxin spilled out of a 96 well plate onto the benchtop in a BSL-3 laboratory. As required by the risk assessment, all staff members were in Respiratory Protective Equipment (RPE) at the time of the spill. The RO was informed, a Form 3 was filed, and the CMA ruled no potential exposure.
18. **SPILL SUMMARY:** 01/03/2018; A staff member reported that a sleeve fell out of a BSC in a BSL-3 room. All personnel in the room were in RPE at the time. The RO was informed and the CMA ruled no potential exposure.

19. **SPILL SUMMARY:** 01/09/2018; A staff member reported that a small amount of a RG 2 agent spilled (out of conical tubes) inside a sealed bag in a BSL-3 laboratory. The RO was informed and the CMA ruled no potential exposure.
20. **SPILL SUMMARY:** 01/16/2018; A staff member mistakenly spilled a beaker containing a solution of disinfectant and a RG 2 agent inside a BSC in a BSL-3 laboratory. The RO was informed and the CMA ruled no potential exposure.
21. **PROCEDURAL ERROR SUMMARY:** 01/22/2018; A staff member reported that they did not don a (required) PAPR prior to entering a BSL-3 laboratory. The worker was preparing to start work. The RO was informed and the CMA ruled no potential exposure.
22. **PPE FAILURE SUMMARY:** 01/24/2018; A staff member reported a single glove tear (nitrile) as they were setting up the BSC in a BSL-3 laboratory. The RO was informed and the CMA ruled no potential exposure.
23. **PPE FAILURE SUMMARY:** 01/29/2018; A staff member reported a single glove tear (nitrile) as they were removing their lab coat in a BSL-3 laboratory. The RO was informed and the CMA ruled no potential exposure.

OTHER OCCURRENCES

24. **PROCEDURAL FAILURE SUMMARY:** 11/01/2017; A staff member reported that they used a BSL-4 suit without changing the outer gloves within the month. The gloves were changed after the staff member came out of the BSL-4 suite.
25. **EQUIPMENT FAILURE SUMMARY:** 11/09/2017; A staff member reported a disagreeable odor coming from a small -80 freezer in a BSL-2 laboratory. The cause of the odor was melting silicone sealant on an overheating compressor. The freezer was taken out of service and removed from the lab for repairs.
26. **SPILL FAILURE SUMMARY:** 11/15/2017; A staff member reported a dry brownish stain in the middle of a BSL-2 laboratory floor. The stain was caused by a spill of floor cleaner (from the hallway floor waxing operation) that had migrated into the lab and dried overnight.
27. **PROCEDURAL FAILURE SUMMARY:** 12/22/2017; A staff member reported that an autoclave timed out (failed) due to an incorrectly chosen sterilization cycle. Upon further review, there was poor understanding that carcasses cannot be mixed with regular trash in the same autoclave run, and that the maximum validated load of biomass cannot exceed 25 lbs. for non-agricultural animals. The waste was allowed to undergo a full biomass cycle, opened and the waste separated in containment, and the biomass and trash run in separate successful cycles prior to being removed from containment. Several corrective actions resulted from this mishap including retraining of staff and at least two SOP revisions.
28. **PROCEDURAL FAILURE SUMMARY:** 12/28/2017; A subcontractor entered a BSL-3 laboratory in RPE without respiratory protection training from the RP Administrator (they wore a 3M Versa Flow PAPR although they had not been trained on its use). The subcontractor was scheduled to receive 3M Versa Flow training upon their return to the NBACC.

29. **FACILITY PROCESS FAILURE SUMMARY:** 01/03/2018; A subcontractor drilled into live electrical conductors while boring through the concrete deck. The drill was double insulated with a grounding plug and the breakers for the electrical conductors tripped immediately. A more thorough review of the structural building plans will be conducted in the future.
30. **SPILL SUMMARY:** 01/04/2018; A staff member reported that one of the micropipette tips from a Precision® robot missed the sharps container and fell onto the diaper in a BSC in a BSL-3 laboratory. The group is brainstorming ideas to better ensure that the sharps container is properly situated at all times.
31. **FACILITY PROCESS FAILURE SUMMARY:** 01/04/2018; Several staff members reported that they were locked out of various rooms in BSL-2 and BSL-3 during maintenance of the security systems. In the future all maintenance on PIN readers will be coordinated with lab staff.
32. **SPILL SUMMARY:** 01/26/2018; A staff member dropped a glass slide containing fixed and non-infectious material onto the floor of the atrium. In the future, transfers of glass slides will be conducted using a container.

Document Definitions:

Event Summaries – Any OSHA recordable mishap or first aid injury or illness.

Near Miss Summaries – Any mishap that requires a potential exposure ruling from the Competent Medical Authority (CMA) or represented a CDC Form 3 submission.

Other Occurrences – Mishaps that do not fit into the other two categories.