



# Lessons Learned & Success Stories – September to November 2019

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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.

## **LESSONS LEARNED:**

1. After reviewing spill incidents, there are several lessons that can be learned or safety procedures/best practices that can be emphasized.
  - Any person, regardless of experience level, has the right and responsibility to call a stop work when they observe staff members performing activities that are not safe, outside the guidance of a Health & Safety Standard Operating Procedure (SOP), or not within the spirit of the safety culture at NBACC. This includes staff members who are involved in the incident or people who witness the incident.
  - Any spill that requires clean up, biological or chemical, must be reported to Health & Safety. If the spill involves Biological Select Agent or Toxin (BSAT), the Responsible Official must also be notified.
  - In the event of a chemical spill, the cleanup procedure must be discussed with the Chemical Hygiene Officer to ensure that the chemical is cleaned up properly, so as to ensure that the cleanup does not increase the hazard associated with the original spill. Improper mixing of chemicals may result in permanent damage of equipment and infrastructure, or cause an adverse chemical reaction that may result in an exothermic event or emission of noxious or toxic gas.
  - If you are involved in an incident (spill or otherwise), it is appropriate to call a stop work, secure BSAT (if necessary), leave the room, prohibit entry into the room, and contact Health & Safety to discuss an appropriate response to the safety incident. It is always better to discuss an incident with Health & Safety to ensure that there is an appropriate response than to make a “best guess” at a response.
  - Lastly, when reporting an incident to Health & Safety, please be reminded that the report must accurately represent the details of the incident, so an appropriate safety response can be deployed.
2. Staff should be vigilant in checking themselves and their escorts before going into any laboratory. This should include removing jewelry, checking Escorted Laboratorian Form (ELF) cards and attending to any medical modification to access, such as applying a waterproof Band-Aid.
3. In an incident described below, staff autoclaved equipment that had been placed in autoclave bag earlier in the year. They inadvertently autoclaved the item on the wrong cycle because they did not know that the equipment had a tube of liquid attached. The cycle chosen was appropriate for equipment, but not for equipment with liquids. Safe conduct of research principles teach us that a questioning attitude is cultivated and that hazards are identified for every task every time. When we are performing familiar tasks it is easy to overlook minor differences, in this case the attached tube of cleaning fluid. Having a questioning attitude and looking for potential hazards can help us avoid accidents and adverse events.

### EVENT SUMMARIES:

1. **FIRST AID SUMMARY:** In all of the following incidents, personnel reported to the Competent Medical Authority (CMA), first aid was applied as necessary, and laboratory restrictions were placed, if needed.
  - 08/02/2019; A staff member was reaching for an item on a metal shelf in their cubicle when they scraped their right hand.
  - 08/05/2019; A staff member working on an autoclave reached into the top of the unit and scraped their hand on a metal bracket.
  - 08/20/2019; A staff member working in an interstitial area was attempting to center a pallet jack when they stepped off the yellow-painted walkway and scraped their head on an overhead metal bracket. Hard hats are required when stepping off the yellow walkway, but the staff member was not aware that they had stepped off the path when adjusting the jack.
  - 09/05/2019; A staff member was repairing a HEPA filter seam leak when they scraped the back of their right hand on the HEPA baffle.
  - 09/05/2019; A staff member was breaking down cardboard boxes on the loading dock when they scraped one of their fingers on a staple.
  - 09/17/2019; A staff member was kneeling down to remove their shoe covers when, upon standing up, they scraped the top of their head on the wall-mounted shoe cover box.
  - 09/18/2019; A staff member was removing a hard drive from a system, when the installation bracket caught their fingernail and pulled it back.
  - 10/02/2019; A staff member was exiting an airlock when they scraped one of their fingers on a laminated sign.
  - 10/29/2019; A subcontractor scraped their finger on the locking mechanism of a locker in a Biosafety Level (BSL)-4 change room.

### NEAR MISS SUMMARIES:

1. **SPILL SUMMARY:** 08/02/2019; Staff members working at the bench top in a BSL-2 laboratory were measuring out powder dye when the powder spilled, aerosolized, settled on the bench top and floor of the laboratory, and was then inadvertently tracked around the room causing the laboratory floor to stain. After identifying the chemical spill, staff members attempted to clean the dye with IPA prior to contacting Health & Safety to report the spill. Another BSL-2 staff member walking in the hallway observed the chemical clean up through the door window, and indicated that the spill must be reported to Health & Safety. After reporting the spill, the staff members completed the cleanup of the spill. The dye did not come in contact with the staff members' skin, and they did not exhibit any signs or symptoms of respiratory distress. The CMA ruled no potential exposure. Health & Safety would like to remind staff to call the Chemical Hygiene Officer in the event of unintentional spill/aerosolization of any chemical prior to cleanup.
2. **PROCEDURAL FAILURE SUMMARY:** 08/08/2019; A staff member working in a BSL-3 laboratory opened an inner bag containing tubes of Risk Group (RG) 2 agent samples outside of the Biosafety Cabinet (BSC). The sample tubes were placed in a metal rack and placed in an inner and then an outer bag by another group in the BSL-3 suite before being handed to the staff member. Both bags were decontaminated before being handed off, but the tubes and the metal rack were not. The receiving staff member reported the incident as soon as they were aware that the tubes had not been decontaminated. No spills or leaks were present inside the bag and the sample conical tubes and the

staff member reported no issues with their respiratory protection. The CMA ruled no potential exposure.

3. **PERSONAL PROTECTIVE EQUIPMENT (PPE) FAILURE SUMMARY:** 08/09/2019; A staff member working in a BSL-3 laboratory was exiting the BSC after performing microtitrations of a RG2 agent when they noticed a hole in one of their inner gloves. The staff member had already discarded their outer gloves into a biohazard bag and was unable to confirm that they had remained intact. The staff member removed their inner gloves, washed their hands, and called the Command Center. The CMA confirmed that staff member's skin remained intact and showed no signs of cut or scrapes and ruled no potential exposure.
4. **PROCEDURAL FAILURE SUMMARY:** 08/09/2019; A staff member working in a BSL-3 laboratory opened an incubator and discovered four plates that had been infected with a RG3 agent on their side within an unsealed Ziploc bag. The staff member sealed the bag, placed it in a transport container, took it to another laboratory and placed the bag inside the BSC. Upon further inspection, the bag and the plates appeared to be dry; however, both the plates and the bag were decontaminated and discarded. The CMA ruled no potential exposure. The staff member noted that because the plates stacked on top of each other and were the only items in the incubator, it is likely that they were knocked over while they were being placed inside the incubator. Moving forward, the Laboratory Space Manager (LSM) has asked staff members to limit how high they stack plates and be mindful when placing items in and removing items from incubators.
5. **SPILL SUMMARY:** 08/29/2019; A staff member working in a BSL-3 laboratory was finishing up their work at the benchtop when their lab coat sleeve caught a plate containing a RG2 agent and overturned it, spilling roughly 10mL on to the benchtop. Though the plate was fixed with 80% methanol, methanol fixation is not considered an approved inactivation method for the agent involved. The staff member held their breath, left the laboratory and called the Command Center. After speaking to a member of Health & Safety and waiting the 30 minutes for aerosols to settle, the staff member was permitted to reenter the laboratory wearing an Assigned Protection Factor (APF) 1000 Powered Air Purifying Respirator (PAPR) to clean up the spill. The CMA ruled no potential exposure.
6. **SPILL SUMMARY:** 09/24/2019; A staff member working in the BSC of a BSL-3 laboratory was transferring a 96-well plate to a plate washer when they bumped the washer and a drop of liquid from the plate spilled onto an absorbent pad below. The plate had been infected with a RG2 agent. Though the plate was fixed with 80% methanol, methanol fixation is not considered an approved inactivation method for the agent involved. The employee reported that there were no issues with the BSC and there were no breaches in their PPE. The CMA ruled no potential exposure.
7. **PPE FAILURE SUMMARY:** 09/25/2019; A staff member on a vaccination waiver was witnessing BSAT movement in a BSL-3 laboratory when, upon removing their outer glove, they tore their inner, right glove. The staff member washed their hands, donned another pair of inner gloves and taped them to their scrubs. There was no spill of material and there was no imperfections to the staff member's skin. The CMA ruled no potential exposure.
8. **PROCEDURAL FAILURE SUMMARY:** 09/27/2019; A staff member in a BSL-3 change room crossed the line of containment without their required waterproof Band-Aid. The staff member recognized that they did not have their waterproof Band-Aid prior to entering the BSL-3 suite and had another staff member in the change room pass it to them across the line. The CMA ruled no potential exposure.

9. **EQUIPMENT FAILURE SUMMARY:** 09/27/2019; A staff member working in a decontaminated quadrant of the BSL-4 noticed that air had leaked through the Air Pressure Resistant (APR) door dividing the decontaminated space from the active BSL-4 suite. Upon further investigation it appeared that the gasket of the door was not entirely sealed. Prior to the discovery, a number of staff members entered the decontaminated space without PPE. Though normal work had taken place in the BSL-4 the prior week, there had been no spills of agent and there was no active work taking place when the staff members entered the decontaminated space. The door gasket was repaired and the space underwent another Vaporous Hydrogen Peroxide (VHP) decontamination. The CMA ruled no potential exposure.
10. **SPILL SUMMARY:** 10/07/2019; A staff member that had been working in the BSC of a BSL-3 laboratory was cleaning up when they noticed a pipette tip on the floor. The staff member had been working with a RG2 agent in the BSC. The tip appeared unused and the staff member had not lost any contaminated pipette tips during the course of their work, leading them to believe that the tip was pulled from the box by their sleeve when they attempted to pull a different tip. The employee reported that there were no spills inside the BSC and their respiratory protection was working properly. The tip and the floor were decontaminated. The CMA ruled no potential exposure.
11. **SPILL SUMMARY:** 10/29/2019; A staff member working in a BSL-3 laboratory reported that they dropped a microscope slide onto the floor. The slide was a heat-fixed gram stain of a RG3 agent. The employee immediately picked up the (unbroken) slide, washed their hands and left the room. They called the Command Center and requested Health & Safety in order to report the spill. After 30 minutes, the employee was permitted to re-enter the room and clean the area of the floor where the slide landed. The CMA ruled no potential exposure.
12. **PROCEDURAL FAILURE SUMMARY:** 10/27/2019; A staff member reported to Health & Safety that a piece of equipment had been incorrectly autoclaved out of the BSL-4 suite. The piece of equipment had a small tube of cleaning fluid attached to it that was not identified prior to being autoclaved on a 'utensil cycle.' The item had been placed inside autoclave bags earlier in the year, and in preparation for an upcoming inspection and project work, staff members placed it in the autoclave without realizing the tube was still attached to the instrument. After autoclaving, the equipment was placed on a cart and handled by multiple employees before the tube was noticed. Because the item was not run on a 'liquid' autoclave cycle, it could not be confirmed that the liquid component was autoclaved at the proper temperature. However, the mechanics of the equipment suggests that the liquid would not come in contact with any material that the equipment processed. After consultation with Health & Safety, staff bagged the piece of equipment and autoclaved it on a liquid cycle. The cart where the equipment was placed was decontaminated, and staff members that had handled the instrument were evaluated by the CMA for skin imperfections. The CMA ruled no potential exposure.
13. **PROCEDURAL FAILURE SUMMARY:** 10/29/2019; A staff member working in a BSL-3 laboratory reported that while they were attempting to remove the rotor from a centrifuge, they accidentally opened the lid of the rotor outside of the BSC. The rotor contained tubes from an RNA extraction of a RG3 agent. The researcher was attempting to remove the rotor in order to place it back in the BSC. The staff member estimated that the centrifuge run ended ~ 1 minute before the lid was opened. They did not wait the required 2 minutes before opening the centrifuge. As soon as they realized the rotor lid was off, they immediately closed the lid, placed the rotor in the BSC and left the room. The staff member called the Command Center and, after speaking to Health & Safety and waiting 30 minutes, they were permitted to reenter the room. Upon reentry, the staff member confirmed that all the tubes in the rotor had been capped properly and there had been no spills or leaks inside the rotor. The CMA ruled no potential exposure.

14. **PROCEDURAL FAILURE SUMMARY:** 10/29/2019; Staff members working in the BSC of a BSL-3 laboratory bumped the disinfectant reservoir of a robot and spilled approximately 20mL of MicroChem onto the stand of the robot and the floor of the BSC. The reservoir was used to disinfect pipette tips that had been used with a RG3 agent. At the time of the spill, the full contact time had not elapsed. The staff members called the Command Center and, after speaking to Health & Safety, cleaned the spill and resumed their work. The CMA ruled no potential exposure.
15. **PROCEDURAL FAILURE SUMMARY:** 10/29/2019; A staff member working in a BSL-3 laboratory, having received double-bagged tubes from a BSL-4 cabinet laboratory, opened both bags outside of the BSC. After opening the bags, the staff member recognized that they should have opened the bags in the BSC and immediately placed the bags in the cabinet, left the room, called the Command Center and requested Health & Safety. There were no leaks from the tubes and all tubes were capped tightly, however the tubes had not been wiped down with disinfectant prior to being placed into the inner bag. Health & Safety is currently evaluating potential changes to the process of removing items from Class III cabinets. The CMA ruled no potential exposure.

#### **OTHER OCCURENCES**

1. **PROCEDURAL FAILURE SUMMARY:** 08/14/2019; A staff member working in an ABSL-3 laboratory noticed that a blower unit that was attached to a caging system had been out of certification for 9 days, but was still in use. This particular study involved a RG2 agent, which does not require HEPA filtration housing; however, NBACC goes above and beyond while using this equipment. Although it had been out of certification, the equipment monitor showed performance was within acceptable parameters for the duration of use, the unit was certified the same day it was found, none of the animals housed in the caging system were harmed, all staff members that entered the room were vaccinated for the RG2 agent, and all staff members were wearing PAPRs (APF 25). Upon further investigation, it was determined that the unit had been placed out of service in 2017 and when it was recertified in 2018, the unit's certification status was not updated, nor was there any notification that the unit was being put back into service. The Comparative Medicine and Equipment Calibration groups are working together to determine ways to improve communications involving equipment certifications.
2. **PPE FAILURE SUMMARY:** 09/10/2019; A staff member working in a BSL-3 laboratory was surface decontaminating an incubator for movement into a VHP decon when they tore their glove on a wire holder on the back of the unit. There was no agent present and the staff member's skin remained intact. The CMA ruled no potential exposure.
3. **PROCEDURAL FAILURE SUMMARY:** 09/15/2019; A staff member working in the vivarium pushed a cart loaded with cages onto the vivarium-designated elevator when they realized they did not have their badge. When the staff member walked away to retrieve their badge, the elevator doors closed with the cart inside. The staff member tried to recall the elevator but the call was overridden by staff members requesting the elevator on others floors. Several staff members witnessed the cart unattended in the elevator, and eventually, a staff member that had been trained with the Comparative Medicine group entered the elevator and accompanied the cart back to the vivarium. The original staff member was reminded to follow all SOPs, and either lock the elevator during transport, or remove the cart from the elevator until they are able to complete the transport.

4. **PROCEDURAL FAILURE SUMMARY:** 09/15/2019; A staff member wore their necklace into a BSL-3 suite. Upon entering the suite, the staff member immediately noticed the necklace and reported the incident to Health & Safety. The necklace was made of a smooth metal and was able to be decontaminated and removed from containment.
5. **PROCEDURAL FAILURE SUMMARY:** 09/16/2019; An individual was escorted into vivarium and ABSL-2 spaces without an approved escorted laboratorian form ELF in place. The individual had all of the required medical clearances, but their form had not been fully signed and they did not have an ELF card. Health & Safety would like to remind staff to always check the ELF cards of those you are escorting.
6. **PROCEDURAL FAILURE SUMMARY:** 09/20/2019; A staff member that was cleaning up after an event in the atrium noticed flames coming from a trash can. The staff member immediately poured their drink on the flames to put the fire out. Another staff member poured an entire pitcher of water onto the trash and the trash was taken down to the loading dock and placed into the trash bin outside of the building. After the trash had been removed, an employee radioed a member of Health & Safety to describe the incident. The two responding Safety members discussed the events with the staff members that were present and monitored the trash bins outside of the building for 30 minutes. Upon further investigation, a Sterno heating canister was thrown into the trash can prior to being fully extinguished. Moving forward, a designated group of individuals will be trained and briefed on the set-up and disposal of Sterno canisters, and those individuals will be the only staff members permitted to handle the canisters. As a reminder, the Command Center should be called immediately in emergencies and not Health & Safety directly. Delaying calls to the Command Center has the potential to create other dangerous situations.
7. **SPILL SUMMARY:** 10/17/2019; A staff member working in the BSC of a BSL-3 laboratory was emptying the sharps container of a robot when they noticed a loose tip sitting on the robot next to the disinfectant reservoir. There was disinfectant present in the tip but the staff member was not sure when the tip landed on the robot. The staff member was also unsure whether the tip fell from the robotic arm or from the sharps container. The staff member called the Command Center and reported the spill to Health & Safety. The tip and the robot was properly decontaminated.

**Note:** *It should be assumed that staff are wearing a PAPR (minimum APF 25) in events taking place in the BSL-3 laboratories unless otherwise stated.*

#### **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.