

# Lessons Learned & Success Stories – January to March 2022

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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.

## **SUCCESS STORIES**

1. An alternative to chemical hair removal was developed by several members of the Comparative Medicine group. In a particular study, mice were required to have areas of hair removed with a chemical hair removal cream for specific procedures. One team member came up with the idea however of changing this process by removing the hair using wax strips. It was determined that one wax treatment was sufficient to remove unwanted hair for the duration of the study, whereas chemical hair removal treatments had to be done approximately every other day to maintain the desired level of hair removal. This process improvement enhances animal welfare by reducing the need to anesthetize and reducing skin irritation caused by hair removal. This change also eliminates a source of mixed chemical waste that requires special handling and disposal. This process was further refined as the staff gained experience using the wax strips. This success shows that most processes can be refined with time and effort to make them safer and more efficient.
2. When a member of the Comparative Medicine group was injured while moving a rack, that staff member and another Comparative Medicine member decided to investigate potential modifications to prevent the incident from reoccurring. After brainstorming a few improvements, they landed on a solution to add another handle to the rack. Adding a handle to the side of the rack removes the users’ hands from possible pinch points. The two staff members reached out to facilities for help executing the plan. Once they had explained their design, the facilities engineer fabricated and welded the handle to the rack. Though simple, the new handle protects staff from a not-so-obvious pinching hazard. It isn’t always possible to predict a near-miss or injury, but it is possible to use the knowledge from previous incidences to prevent the next one. Being proactive with our safety and the safety of our colleagues is always a success story.

## **LESSONS LEARNED**

1. Following proper spill response and safety reporting procedures, even for seemingly innocuous situations, protects you, your co-workers, and the company itself. By properly reporting spills and other instances to Environmental Health and Safety, the information is passed along to people who may need to complete additional reporting, such as the Institutional Biosafety Committee (IBC) Chair, the Competent Medical Authority (CMA), or the Responsible Official (RO). This month’s summaries are a great example of lab staff following their training on lab spill response and mishap reporting – keep up the good work, NBACC!

2. NBACC is a fast-paced work environment. Deadlines, deliverables, and due dates are all commonplace here. Understandably, staff value their time and often look for ways to be most economical. In practice, this typically involves minimizing the processes that slow us down. However, while certain NBACC processes or systems can seem burdensome, many are mechanisms of safety and oversight. So, there is a balance between achieving maximum safety and being time-sensitive. Consider the process of placing an order for goods. Adding approvers to orders guarantees that any potential hazards associated with that order have been assessed and weighed appropriately by the subject matter experts. The process takes the requestor a few minutes longer but comes with the assurances that the transaction will not lead to future safety issues. This message is applicable to all areas of NBACC, from ordering, to lock out tag out, to waiting two minutes “settle time” when centrifuging outside of containment. Staff are encouraged to continuously look for ways to improve and streamline NBACC processes, but the health and safety of NBACC is dependent on adherence to the processes we have in place.
3. This month (March) has highlighted how safety related events are not isolated to laboratory activities. Every aspect of your workday, whether it be walking into the building, sitting in your cubicle, or working in the buffer corridors, can lead to an event that could put you or a coworker’s safety at risk. It is important for all staff to remain vigilant and continue to report these events to ensure the continued safety of everyone who works here.

#### **EVENT SUMMARIES**

**FIRST AID SUMMARIES:** In all the following incidents, personnel reported to the Competent Medical Authority (CMA), first aid was applied as necessary, and laboratory restrictions were placed, if needed:

- 12/10/2021; A staff member tested positive for COVID-19 at work, as verified by the CMA. Full contact tracing per CDC guidance was conducted by the CMA, and staff members who had been in close proximity with one another were informed and asked to monitor any symptoms. When reviewing the close contacts list, it was suggested that the staff member’s infection could be attributed to another staff member who had recently tested positive for COVID-19. The positive staff member was placed on a mandatory 10-day home isolation. The workstations of the positive individuals and their contacts were disinfected, and a reminder was sent to all staff to clean their workstations at the end of each workday. This event represents an OSHA recordable event.
- 12/22/2021; A staff member sustained a cut near their left thumb when the lid of a microcentrifuge they were removing from a Biological Safety Cabinet (BSC) closed on their thumb. While their gloves remained intact, the staff member noticed a small amount of blood begin to pool under the glove. The staff member removed their gloves, washed their hands, and exited the BSL-3 suite to report to the CMA.
- 01/14/2022; A staff member cut their heel when the cart that they were pulling through a door came in contact with their heel.
- 01/25/2022; A staff member was removing their NBACC-approved iPad from its case during property management inventory when they cut their right finger on the case.
- 01/31/2022; A staff member was pushing a recently sterilized rack of cages when the wheels of the rack hit a lip on the floor and caused one of the cages to smash the staff member’s right finger.
- 02/17/2022; A staff member fell while attempting to sit in their chair and hit their back.
- 02/26/2022; A staff member was returning their Powered Air Purifying Respirator (PAPR) to a storage rack when they scraped their right pinkie on the metal shelf.

- 02/28/2022; A staff member working in the BSL-3 was carrying boxes of gloves when a box slipped and cut their left thumb.

### **NEAR MISS SUMMARIES**

1. **SPILL SUMMARY:** 12/07/2021; A staff member was working in a BSL-2 laboratory when they discovered a leak in the flask they were viewing on the microscope. The flask contained cells inoculated with a Risk Group (RG) 1 agent. Roughly 0.5 mL leaked from the flask onto the staff member's gloves and another flask that was beneath it in the incubator. The staff member immediately held their breath, removed their gloves, washed their hands, and exited the laboratory. They contacted Health and Safety and, after waiting the required 30 minutes, they re-entered the laboratory to clean up the spill. The staff member's gloves and skin were intact at the time of the incident. The CMA ruled no potential exposure.
2. **SPILL SUMMARY:** 01/13/2022; A staff member working in a chemical fume hood (CFH) in a BSL-2 laboratory was preparing to load a sample containing a RG2 agent into an instrument when they noticed 10 mL of liquid at the base of the instrument on the "pan" of the CFH. Immediately after noticing the leak, the instrument software stopped the pump due to low pressure. Staff exited the room and contacted Health and Safety. The spill remained contained inside the CFH. After speaking with a member of Health and Safety, the staff members were permitted to re-enter the room and clean the spill. Once the spill was cleaned and the surfaces were decontaminated, the equipment was inspected, and a leak was discovered at a plastic fitting between a valve and some tubing. Based on the volume of the spill, the length of the previous run and the flow rate, it is unlikely that the leaked material contained any of the RG2 agent. The leaked material was most likely solutions used to move the sample through the instrument. The staff members conducted leak checks during instrument start-up and column equilibration at the beginning of the day, and no leaks were identified. Staff replaced the faulty fitting, and the group is considering implementing additional leak checks during instrument use.
3. **PROCEDURAL ERROR SUMMARY:** 01/13/2022; A centrifuge was removed from a BSL-2 laboratory without first having the HEPA filter removed. Staff requested to have the piece of equipment serviced. It was surface deconned, and the decontamination paperwork was provided to the Property Management Group so that they could move the unit. Once the equipment had been removed from the laboratory, a subcontractor discovered that the centrifuge still had its HEPA filter in place. The subcontractor contacted Health and Safety and, after speaking with the Laboratory Space Manager of the space, confirmed that no infectious agents had been spun in the unit. In this incident, an external service contractor was onsite and offered to service the unit at the last minute. Due to the late request and desire to get the unit serviced, property management worked with the staff members to get the unit removed from the laboratory without having an approved ticket. Had a ticket gone through the system, it is likely that the unit would have been flagged for the removal of the HEPA filter. As a reminder to staff, movement of laboratory equipment should be requested via a ticket.
4. **FACILITY PROCESS FAILURE SUMMARY:** 01/21/2022; A staff member was working in a BSL-3 suite when they noticed that air was flowing out of a laboratory and into the BSL-3 suite hallway. The laboratories are under negative pressure, meaning that the air in the hallway is pulled into the laboratories. The staff member noticed the directional change in airflow by observing a Kimwipe that was attached to the bottom of the laboratory door. The Kimwipes are used to provide a visual

indicator of airflow. The staff member checked the differential pressure gauge at the laboratory door which confirmed that the air was being pulled into the hallway. The staff member had checked the pressure before entering the suite and all of the laboratories in the suite were operating normally. The staff member then contacted Facilities. Upon investigating the issue, Facilities discovered that while replacing a controller for a different issue, the HVAC offset for the laboratory reverted to an original design setting. The setting was originally intended to make the laboratory air pressure positive to the suite hallway to prevent sample contamination. There were no alarms or display alerts because the system recognized the original setting as 'operating normally.' However, the differential pressure gauge by the laboratory door and visual indicator would have shown that the room was positive to the suite. Facilities confirmed that at no time did the laboratory air breach containment. Moving forward, prior to any controller replacements, Facilities will ensure that the correct settings are confirmed and uploaded. As always, staff should check pressures prior to entering containment. Staff should also make a habit of confirming the differential pressure prior to entering and beginning work in a laboratory.

5. **PROCEDURAL ERROR SUMMARY:** 01/25/2022; A staff member contacted Health and Safety and reported a burning smell coming from a kitchen. The source of the smell was determined to be a smoldering potholder that had been placed on top of a toaster oven that was left on. Upon further inspection, it was discovered that the toaster oven and four others in the building are equipped with a "stay on" feature that can be activated if staff are not paying close attention. The burned potholder was discarded, and Health and Safety placed labels on each of the toaster ovens alerting staff of the feature.
6. **SPILL SUMMARY:** 01/26/2022; Two staff members working in a BSL-2 laboratory were preparing to aliquot tubes of 0.1% formic acid when the bottle containing the acid slipped from one staff member's hands and fell onto its side. Roughly 10 mL of solvent spilled onto the benchtop. The two staff members immediately exited the laboratory and called the Command Center from the hallway. After speaking with a member of Health and Safety, the staff members were permitted to re-enter the laboratory and clean up the spill. The staff members placed the paper towels and gloves used to clean the spill inside a plastic bag, labeled it and placed it in the satellite accumulation point.
7. **SPILL SUMMARY:** 02/07/2022; A staff member in a buffer corridor was opening an autoclave after a successful sterilization cycle when 1-2 gallons of sterile water spilled out of the autoclave and onto the floor of the mechanical space. Health and Safety was contacted, and the water was cleaned by an autoclave technician. Upon further investigation, it was discovered that the autoclave cycle had completed its run on Friday but was not emptied until the following Monday. Condensate liquid filled the autoclave vessel over the weekend and spilled when the staff member opened the autoclave on Monday. As a reminder, when possible, autoclave cycles that are run on Fridays should be unloaded on the same day to avoid the potential for condensate spills.

#### **OTHER OCCURENCES:**

**REPORTED EVENTS:** In all the following, personnel reported the events to Health and Safety, and the events were tracked for trending purposes:

- A staff member working in a BSL-2 laboratory noticed that a balance tube containing small metal beads had cracked during centrifugation in a microfuge. Repeated runs with the same

balance tube may have resulted in the weakening of the tube and the subsequent crack. The staff member moved the beads to a new tube and discarded the cracked tube. Moving forward, a new balance tube will be created each time the microfuge is used.

- A staff member completing their work in a BSL-3 laboratory was following up the surface decontamination of a BSC with an Isopropyl Alcohol wipe down when they noticed a tear in one of their gloves. The staff member discarded their gloves, washed their hands, and contacted Health and Safety. The staff member confirmed that their skin remained intact.
- A staff member was working in the BSC of a BSL-3 laboratory when they bumped their PAPR on the chair where they were sitting, causing the PAPR to shut off. The staff member held their breath, left the room, and called Health and Safety before donning a different PAPR and returning to the laboratory.
- A staff member was working in the BSC of a BSL-3 laboratory when they noticed a spill of 3 mL of media and a RG2 agent on the absorbent pad in the BSC. The spill was the result of a drip from a serological pipette. The spill was contained within the BSC, and there were no issues with the BSC or the staff member's Personal Protective Equipment (PPE) at the time of the incident. The staff member deconned and cleaned up the spill.
- A staff member reported a significant amount of water leaking out of a BSL-3 laboratory and into the suite hallway. Upon further investigation, it was determined that the water was leaking from a water line that was connected to an out-of-service ice maker. Facilities entered the suite and capped the line. The water was cleaned up, and the suite was bleach mopped.
- A staff member working in a BSL-3 laboratory dropped a plate of uninfected cells while carrying it to an incubator. The staff member exited the room and contacted Health and Safety. Since there was no infectious work occurring at the time of the spill and the plate did not contain agent, the staff member was permitted to re-enter the room and clean up the spill.
- A staff member reported that their PAPR unit stopped working while they were working on a computer in a BSL-3 laboratory. The staff member exited the lab and marked the battery 'out of service' before grabbing a new one. Health and Safety will evaluate the old battery during the next laboratory inspection.
- A staff member was working in the BSC of a BSL-2 laboratory when they tore their outer glove while handling a cuvette containing RG1 agent. The staff member removed their outer gloves and confirmed that their inner gloves remained intact by leak test.
- A staff member failed to remove jewelry before entering containment. Upon discovering their mistake, the staff member contacted Health and Safety and the jewelry was bleached out of the suite.
- A staff member was rinsing off a glass slide holder in a sink when it slipped from their hands, fell into the sink, and broke. The staff member used the forceps from the nearby spill kit to retrieve the pieces of glass from the sink, bag them, and place them in a sharps container.
- A staff member working in the BSC of a BSL-3 laboratory was sampling a triple flask containing a RG2 agent when 100 µL of the sample dripped onto the diaper pad inside of the BSC.
- A staff member reported that a 5x5 foot section of aluminum sheathing ripped away from the east face of the building exterior and fell on the grass near the outdoor eating area.
- A staff member in the BSL-3 suite reported that their PAPR blower shut off multiple times shortly after donning it in the PAPR staging area. After troubleshooting and trying the motor

unit with multiple batteries, it was placed out of service until it could be evaluated by Health and Safety.

- A staff member working in the BSC of a BSL-3 laboratory was holding the cap from a bottle of distilled water when it slipped out of their hand and fell out of the BSC. No work with agents was taking place in the BSC at the time of the spill.
- A staff member was working with a RG2 agent when they noticed a pinhole in one of their outer gloves. The staff member discarded their outer gloves and tested their inner gloves which were confirmed to be intact.

**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), represented a CDC Form 3 submission, or a potentially serious accident or incident that could have resulted in personal injury, illness, death, and damage to property or the environment, but did not occur due to one or more factors.

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

**Success Story** – A successful process improvement or response to an event that went above or beyond normal operations, where an injury was prevented, or the improvement had a positive effect on a program, project, or activity.

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All research was conducted in compliance with the Animal Welfare Act and other federal statutes and regulations relating to animals and experiments involving animals and adheres to principles stated in the Guide for the Care and Use of Laboratory Animals, and approved by both the NBACC Institutional Animal Care and Use Committee and, when applicable, the DHS Compliance and Assurance Program Office. The facility where this research was conducted is fully accredited by AAALAC International and maintains a Public Health Service (PHS) Humane Care and Use of Laboratory Animals (Policy) assurance.