

**Near Miss and Incident Reporting in a Post-Secondary Institution's Academic  
Laboratories**

by

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## **Abstract**

Incidents and near-misses are common to every workplace and academic laboratories are not exempt. Many academic laboratories conduct high-risk work including working with hazardous materials or dangerous equipment. It is common to hear in an academic laboratory that incidents go unreported, but the question remains if this is truly the case. This paper examines the near misses and incidents that occur at a large Canadian post-secondary institution with a focus on academic labs with high-risk activities. It explores the number and types of incidents that occur in lab-heavy faculties including science, engineering, and medical disciplines. This paper concludes that although it cannot be conclusively stated that near-misses and incidents are under-reported in academic laboratories, this study provides evidence in support of that hypothesis. In addition, it concludes that there is room for improved near miss and incident reporting.

## **Preface**

This thesis is an original work by Greg Hodgson. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Lab Incidents and Near Miss Reporting", No. Pro00115114, October 29, 2021.

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## **List of Abbreviations**

H&S – Health and Safety

OHS – Occupational Health and Safety

STEM – Science, Technology, Engineering, and Math

CCOHS – Canadian Centre for Occupational Health and Safety

IRS – Internal Responsibility System

CSA – Canadian Standards Association

PDCA – Plan Do Check Act

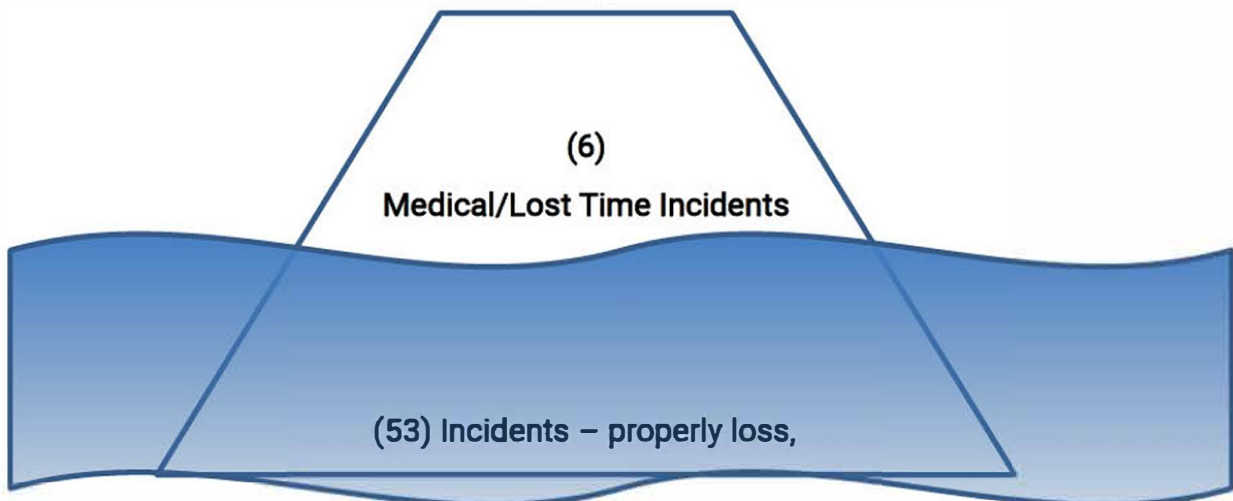
WCB – Worker’s Compensation Board

# Chapter 1

## Introduction

Near misses (also sometimes called near hits or close calls) and incidents (herein referred to as incidents, unless separation is required) unfortunately still occur in every workplace. One purpose of a health and safety management system is to minimize the likelihood of an incident occurring and reduce the severity of any potential consequences when an incident does occur. Accident causation theory explains how incidents are caused and understanding how many incidents occur is a key piece of information to support the prevention of incidents.

There are many theories regarding accident causation in the workplace. Germain et al. proposed an Iceberg Model (Germain, Arnold, Rowan, & Roane, 1998), in which for every single medical or lost time incident, there are six (6) to fifty-three (53) incidents involving property loss, process failure, material loss, equipment damage, or other costs (such as legal or clerical costs). Figure 1 provides a visual outline of the Iceberg Model. Heinrich et al. proposed a Pyramid Model (Heinrich, Petersen, & Roos, 1980) in which for every 1 major injury, there are 29 minor injuries, 300 no-injury accidents, and 1000's of unsafe practices and conditions.



*Figure 1: Adapted Illustration of the Iceberg Model*



Bird et al. conducted an analysis of over 1.5 million accidents and found an accident ratio similar to Heinrich et al. His model included property damage and found the ratio of 1 serious injury or disability > 30 minor injuries > 300 property damage accidents > 600 incidents with no visible loss (F.E Bird & Germain, 1996). Figure 2 shows a visual representation of the pyramid models from Heinrich et al. and Bird et al.



*Figure 2: Adapted Visual of Heinrich's (top) and Bird's (bottom) pyramid models*

The Health and Safety Executive in the United Kingdom also conducted a study in 1993 (Germain, Arnold, Rowan, & Roane, 1998) looking at a similar ratio. They found a ratio of 1 serious incident > 7 minor Incidents > 189 non-injury incidents.

It is important to note that these ratios may differ depending on the risk of the work activity. When taking risk into account it has been proposed that a low-risk workplace may see a ratio of 20,000 near misses > 2,000 minor injuries > 500 major injuries > 1 fatality. A high-risk workplace may see a much narrower ratio of 100 near misses > 50 minor injuries > 10 major injuries > 1 fatality (Jones & Sawatzky, 2014).

A study in the Netherlands looked at a variety of ratios for specific hazards and found the following ratios (Bellamy, et al., 2008):

- Fall on same level
  - 64 recoverable Injuries > 17 permanent injuries > 1 death
- Contact with moving parts of a machine
  - 11 recoverable Injuries > 57 permanent injuries > 1 death
- Fall from height roof/floor/platform
  - 7 recoverable Injuries > 2 permanent injuries > 1 death
- Struck by a moving vehicle
  - 4 recoverable Injuries > 2 permanent injuries > 1 death

As can be seen with these ratios, some hazards, such as contact with moving parts of a machine, may result in significant injury and have a high number of serious incidents without the same order of magnitude of minor incidents to serious incidents. This reduced ratio needs to be considered for highly lethal activities to prevent an expectation of a lot of near misses before a serious incident occurs. Another study found that the most lethal scenarios are likely to have smaller ratios than those that are moderately lethal or less lethal (Bellamy L. , 2015). These smaller ratios are demonstrated in Figure 3 using “hills” in graph form instead of a pyramid graphic. The activities on the left are considered less lethal, the activities in the middle are considered moderately lethal, and the activities on the right are considered the most lethal.

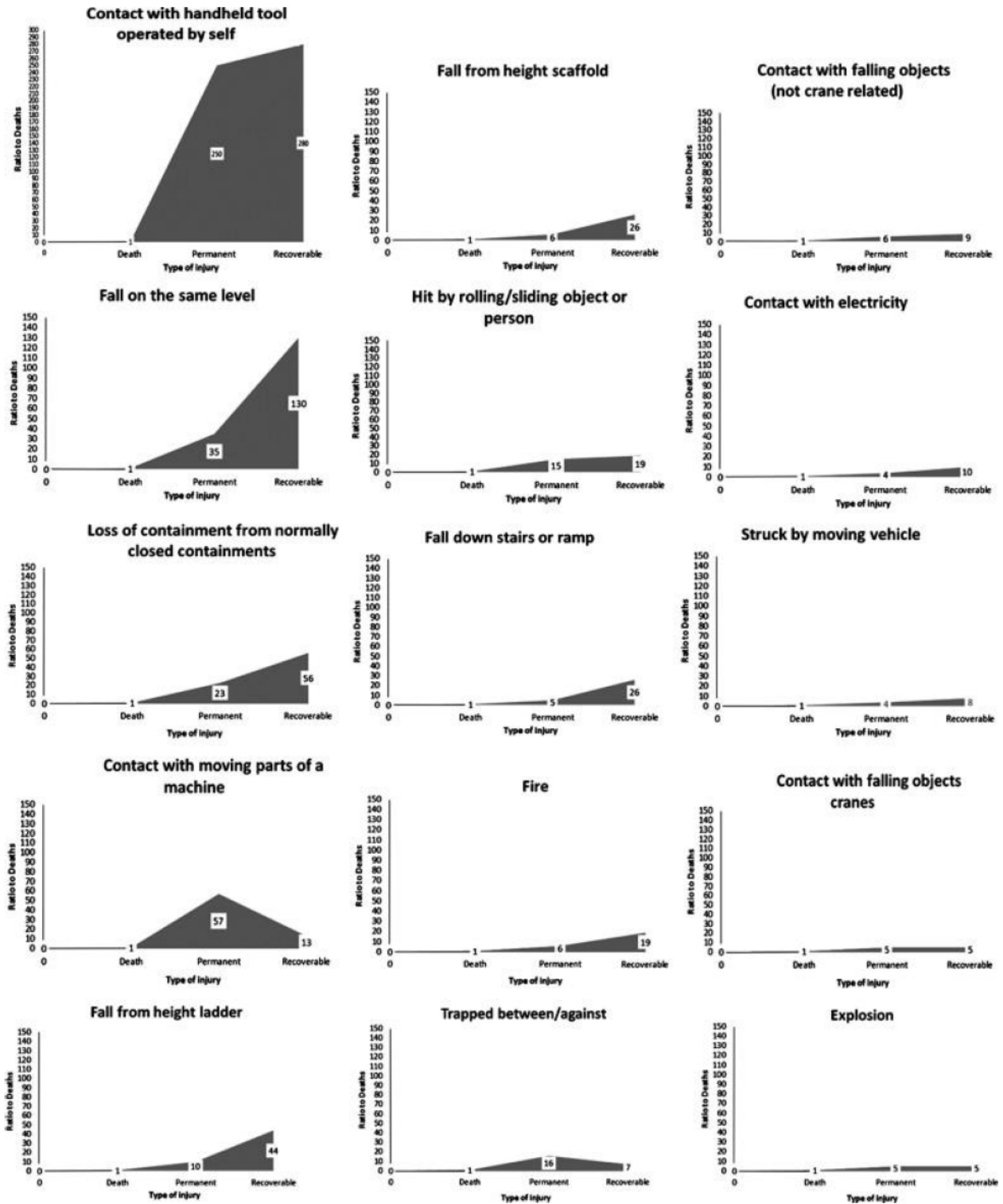


Figure 3: Accident ratio "hills" of serious permanent and serious recoverable injuries to 1 death for a selection of 15 of the 36 hazards.

Reprinted from *Safety Science*, 71, Part B, Bellamy, L, Exploring the relationship between major hazard, fatal and non-fatal accidents through outcomes and causes, Pages 93-103., Copyright (2015), with permission from Elsevier.

The main takeaway from these models is not the specific ratios, but the relative magnitude of the incidents, from no visible losses to the number of incidents with a serious injury or disability. In general, barring specific high-risk scenarios, it can be expected that several near misses and minor incidents will occur for every serious incident.

In addition to the limitations of specific ratios, the pyramid models receive criticism for being over simplistic with regards to incident causation (Marsden, 2017). The focus a pyramid model is on frequency of events. Focusing too much on frequency can take away time and resources from the prevention of more serious incidents. For example, if an organization sees many low-potential near misses, they may look at a pyramid model and think if they can reduce their near misses, they will reduce their severe incidents as well. This may cause them to focus on these low-potential incidents instead of focusing on the high-potential ones that could severely injure or kill someone.

Based on these limitations, an organization cannot be certain that they will have a specific number of reported near misses, property damage, minor incidents, and serious incidents. However, in general, a pyramid model may be used as a comparison to determine if there is the potential for under reporting of incidents and near misses. An understanding the limitations of the pyramid model is important so an organization can focus their attention on the right incidents, instead of focusing too much on simply reducing the overall number of incidents.

In 2019, Dr. A. Dana Ménard and Dr. John F. Trant published a review article in *Nature Chemistry* titled "A Review and critique of academic lab safety research". Driven by several high-profile incidents in academic laboratories, they critically examined the state of academic safety research, including lab accidents, safety training, cultural barriers, and safer lab practices (Ménard & Trant, 2020). Specific to accidents in academic laboratories, they noted the following:

- Chemists at academic institutions are aware and acknowledge that accidents and near misses occur regularly.
- There have been minimal efforts to collate the annual incidence of accidents in academic laboratories.
- There is no comprehensive data on the type of frequency of accidents and near misses in academic laboratories.
- There has been very little academic research into the prevalence and incidence of accidents in laboratories.

Ménard and Trant did find a study by Hellman, Savage, and Keef that examined university 574 accidents over a period of 22 years. They found that the majority of accidents (81%) occurred in teaching labs, 13% in research labs, and 2% in fabrication rooms. They also found that most accidents occurred in entry-level chemistry or organic lab courses, typically by younger individuals. In other, mostly small, studies they found a focus on lab injuries, but noted a focus on injuries does not fully reflect accident rates in laboratories.

Based on their findings, Ménard and Trant noted that the research into accidents in research laboratories is incomplete, but the available information does pose a concern. Anecdotally, it is understood that near misses are very common in laboratories but rarely get reported where there is no injury and no severe property damage. This conclusion is in-line with common accident theories such as the Iceberg Model or the Bird model, in which a certain ratio of near-misses to severe incidents (including property damage, severe injury, and fatalities) occurs.

To thoroughly assess some of the questions posed by Ménard and Trant there first needs to be a proper method of collecting information about incidents. They noted that there is no database to which a researcher could access and conduct research on the incidents in academic laboratories. When looking at any large post-secondary institution in Canada, it can be identified that most institutions have an incident reporting system in place. But the first question that needs to be answered is if all near misses and

incidents are reported through these systems. Without a high-level of reporting, it would be very difficult determine any conclusive information from the available databases.

In general, from a health and safety perspective, it is generally accepted that many incidents and near missed go unreported (Probst, Bettac, & Austin, 2019). But is this true in the academic laboratory setting as well? My hypothesis is that many incidents and near misses go unreported at post-secondary institutions in Canada.

The exploration of this hypothesis includes a review of incident and near-miss reporting at a post-secondary institution in Canada. This exploration includes:

- How many incidents occur versus how many get reported
- What is the level of training and awareness to report incidents
- What types of incidents occur in academic laboratories
- What subcategories of incidents occur in academic laboratories
- How many incidents occur in academic laboratories
- What is the risk ranking of each incident based on the incident details
- What is the risk ranking of each incident based on the potential for harm

The post-secondary institution is a large Canadian institution with ~40,000 students and ~14,000 staff members. There are over 15 faculties and over 200 undergraduate programs and over 500 graduate programs. It has three main Science, Technology, Engineering, and Math (STEM) faculties with a prominent number of laboratories. One is science-based, one is engineering-based, and one is medicine-based. These three faculties will be the focus of this thesis, as explained in Chapter 2: Methodology. The approximate sizes, based on number of staff and students, of the faculties are presented in Table 1. The approximate sizes, based on available programs, of the faculties are presented in Table 2.

*Table 1: Size of STEM Faculties by staff/students*

<b>Size Criteria</b>	<b>Science-based Faculty</b>	<b>Engineering-based Faculty</b>	<b>Medicine-based Faculty</b>
Undergraduate Students	N/A*	4,000	1,000
Graduate Students	N/A	500	1,500
Post-Graduate Students	N/A	1,00	N/A
Staff	3,200	2,700	1,800

\* - N/A denotes not available.

*Table 2: Size of STEM Faculties by Programs*

<b>Size Criteria</b>	<b>Science-based Faculty</b>	<b>Engineering-based Faculty</b>	<b>Medicine-based Faculty</b>
Undergraduate Programs	61	21	6
Graduate Programs (including residency)	N/A*	N/A	82

\* - N/A denotes not available.

Information was collected in two manners. A survey was conducted at the post-secondary institution to determine staff and students' perceptions of incident reporting. The information will allow for the exploration of how many incidents are occurring versus how many get reported, what type of training in incident reporting do people receive, and what level of awareness do they have to report incidents.

The second type of information will be incident reports submitted through the institution's incident reporting portal. These incidents will be explored as follows.

The main types of incidents classified by this post-secondary institution are near-misses, property damage, injury/illness, exposure to hazardous substance, environmental release, and other. Some incidents may include multiple types, such as an environmental release and an exposure to hazardous substances. These incident types will be explored based on reported versus actual type, number of incidents that occurred in each Faculty, and compared to accident theory models such as Bird's pyramid model.

The subcategories of incidents include more specific categories based on what occurred with the incident. These subcategories include, but are not limited to, burns, cuts, drops, strain, pinches, eye, needlesticks, etc.... These subcategories will be explored based on the number that occur in each Faculty to look at trends based on individual work-focus in that Faculty.

The number of incidents will be explored through both comparing faculties and within each Faculty. The total number of incidents will be looked at, including the types and subcategories. The number of incidents will be compared as a whole for the institution and also within each STEM Faculty.

The risk of each incident will be explored by assigning two risk rankings for each incident. The first is the risk associated with the incident as it occurred. The second is the risk potential of the incident should conditions have been different. A matrix will be used for both-risk rankings. These risk-rankings will be explored to look at the severity of incidents and the potential severity in each Faculty.



## Chapter 2

### Methodology

#### Survey

This study involved two sets of data. The first set of data included a self-report survey on the number of incidents and near misses that occur in labs at a large Canadian post-secondary institution, and the number of incidents and near misses that are reported. The second set of data was the actual incidents reported through the post-secondary institution's incident reporting process.

The data on number of incidents and near misses versus the number of reports was collected using an anonymous survey. This survey was communicated through the largest STEM faculties with a large laboratory contingent at the post-secondary institution. The survey requested the following information from the respondent:

- Their faculty
- The type of lab (wet, dry, or other) they work in
- Whether or not they were trained in incident reporting
- Whether or not they were aware of the requirement to report incidents
- The number of near misses that occurred in their lab in the last 6 months
- The number of incidents that occurred in their lab in the last 6 months
- The number of near misses that were reported in the last 6 months
- The number of incidents that were reported in the last 6 months

The number of incidents and near-misses were collected by a scale response including 0, 1-2, 3-5, 5-9, and 10+. A copy of the survey can be found in Appendix I. 41 responses were received in which 36 met the inclusion criteria.

The survey results were collected, and exploratory data analysis was completed. This exploratory data analysis included:

- Types of labs that responded (Wet Labs, Dry Labs, Other)
- Demographics (Staff, Student, Faculty Member, or Student/Staff)

- Training received in incident reporting
- Awareness to report incidents
- Number of near misses that occurred
- Number of near misses that were reported
- Number of incidents that occurred
- Number of incidents that were reported

In addition, statistical analysis was conducted on the survey results. Odds ratios were calculated using STATA 17 statistical analysis software. This analysis was done by separating the respondents into two groups. Group 1, the control group, were those with no perceived difference in the number of near-misses/incidents that occur versus the number of near-misses/incidents that were reported. Those that perceived a difference in the number of near-misses/incidents that occur versus the number of near-misses/incidents that were reported were assigned to Group 2. The odds ratios were calculated based on:

- individual roles (student versus staff member),
- whether or not they individuals were trained to report incidents (trained versus not trained), and
- how experienced the individuals were (inexperience versus experienced).

#### Reported Incidents 2019 - 2022

The data from the reported incidents was collected from the institution's incident reporting system. The data was scrubbed of all identifying information prior to being used for this research project. The data was collected for the period of January 2019 to July 2022.

An exploratory data analysis was completed on the survey data and incident data. This analysis included:

- Separating all the incidents out that occurred in the STEM Faculties

- Separating the remaining incidents by Faculty (Engineering-based, Science-based, and Medicine-based)
- Separating out all the incidents that occurred outside of a laboratory
- Reviewing all incidents to ensure they were assigned the proper incident-type
- Reviewing all incidents and risk-ranking them based on the actual incident and the potential of the incident being worse
- Reviewing all incidents and assigning an incident type subcategory
- Comparing all the data and creating graphs for the above information.

To separate out all the incidents from STEM Faculties, Microsoft Excel was used. The sort function was enabled. All incidents from the engineering-based Faculty, science-based Faculty, and medicine-based Faculty were selected and copied over to another tab. All other faculties and administrative units were excluded, including those incidents that did not have a Faculty listed, unless the Faculty could be identified in incident description.

To separate out each Faculty, the sort-function was used. The engineering-based Faculty incidents were copied into one sheet. The science-based Faculty incidents were copied into another sheet. The medicine-based Faculty incidents were copied into a third sheet. Each individual sheet was then used to identify the remaining information.

All non-lab incidents needed to be excluded. To do this, each incident description was reviewed to determine if the incident occurred in a lab or due to lab-based activities. All non-lab incidents were excluded, such as:

- incidents that occurred in the field as part of field research
- incidents that occurred in administrative locations (such as an office)
- incidents that occurred on the way to or from work (including incidents in the parking lots and sidewalks on campus.
- Incidents that occurred in common areas such as hallways, lounges, study spaces, or staff/student landing space.

All incidents that occurred in a lab or part of lab activities were included. For example, an incident involving taking lab waste to the autoclave room was included as this would be directly related to lab work.

The remaining incidents were then reviewed to ensure the proper incident type was assigned. This included review the incident description to ensure it matched the type of incident listed (near miss, property damage, injury/illness, environmental release, exposure to harmful substances, other, etc...). Where there was clear indication in the description that the type was incorrect, it was assigned to the proper incident type. For example, an incident that was listed as a near-miss, but clearly indicated that there was property damage from a fire in the incident description, was reassigned to the property damage type.

All incidents were risk-ranked using the institution's incident triage risk-ranking criteria, which can be found in Appendix II. The risk-ranking matrix provides criteria to rank the incident as it occurred using a 1-5 ranking system. For injuries/illnesses:

- 1 = No injury/health impact
- 2 = First aid was required
- 3 = Medical aid, modified duty, lost-time injury, or WBC-reportable.
- 4 = Serious Injury, admission to hospital, regulatory reportable
- 5 = Fatality or Serious regulatory reportable

Similar criteria is included for environmental and property damage incidents.

The risk-ranking matrix also provides criteria for near-misses and potentially serious incidents. This approach using a 1-5 ranking system based on the reasonable potential outcome of the incident had circumstances been different. It uses the likelihood of the incident being worse, and the severity to assess the potential of the near-miss or incident. The risk-ranking criteria are:

- 1 – Extremely low potential for injury, property damage, or environmental impact
- 2 – Low potential for injury, property damage, or environmental impact

- 3 – Moderate potential for medical-aid/worker’s compensation board (WCB) injury, property damage, or environmental impact
- 4 –High potential for serious injury, property damage, or environmental impact
- 5 – Extremely high potential for serious injury, death, property damage, or environmental impact.

To assess the incident as it occurred, the circumstances of the incident were compared to the risk-ranking matrix. The criteria used included the type of incident, what type of injury/damage occurred, whether there was lost time, or what type of assistance was required. The incident was risk-ranked based on what was reported.

To assess the potential risk of the incident, the circumstances of the incident were assessed to determine how bad the incident could have been (worst-case scenario) and what was the likelihood of the worst-case scenario occurring. Using the near-miss category in the risk-ranking matrix, the potential severity and likelihood were combined to provide a potential risk-ranking. This was either equivalent to the reported/occurred risk-ranking (the incident was either as bad as it could have been or was very unlikely to be worse) or greater than the reported/occurred risk-ranking (there was an elevated likelihood of the incident being worse than it was).

For example, an incident that involved a minor cut that required a band aid was risk-ranked as a 2 (first aid incident). The second risk-ranking was based on the potential outcome of the incident if conditions had been slightly different. Using the example above, if the cut was from a larger sharp object that could have caused a deep cut requiring stitch, the potential outcome would be risk-ranked as a 3 (moderate potential for requiring medical aid).

Finally, all the incidents were reviewed and assigned a subcategory based on the incident description. These subcategories include:

- Cut/scrapes (cut or skin damage by something sharp)
- Pinch (body part caught between two objects)

- Eye injury (including both physical injury and hazardous materials to the eye)
- Medical (such as syncope/fainting, panic attacks, etc...)
- Dropped object
- Strain (muscle strain such as back, neck, or shoulders)
- Needlesticks (poke with a needle or needle-like object)
- Animal bites
- Allergy (including both allergic reactions and exposure to allergens over time leading to the development of allergies)
- Falls (including slips, trips, and falls)
- Burns (due to fire, hot object, chemical or cold object/substance)
- Chemical (exposure to a chemical that did not cause injury/illness)
- Bio (exposure to a biological substance that did not cause injury/illness)
  - Note: Bio/Chemical exposures that resulted in an injury or illness were classified in one of the above subcategories (such as eye or needle stick)

Graphs and other visualizations of the data were created from the excel spreadsheet. These visuals are available in Chapter 3: Results.

This analysis will be detailed in the results section. In addition, the survey results were analyzed with odds ratios and the incident data was analyzed using Pearson's chi-squared test using STATA, a commercially available statistical analysis software. This analysis will be available in the results section.

## Chapter 3

### Results

#### Survey

The survey received a total of 41 responses from a STEM-based Faculty. Five of the responses were completed incorreccted (identifying that no incidents occurred in their lab, but multiple incidents were reported). It is likely the questions got mixed up, but the survey was completed anonymously, and follow-up could not be completed so the five submissions were excluded.

Of the remaining 36 responses, the majority (29) were from wet labs (labs with chemical, biological, or radiation hazards), one was from a dry lab (labs with minimal or low-risk hazards), and six responses were from other labs (labs with minimal hazardous materials but other high-risk hazards such as machinery and power tools). The types of labs are presented in Figure 4. The demographics of the responses included 18 students (including grad students), 13 staff members, four faculty members, and one student/staff member. The demographics and presented in Figure 5.

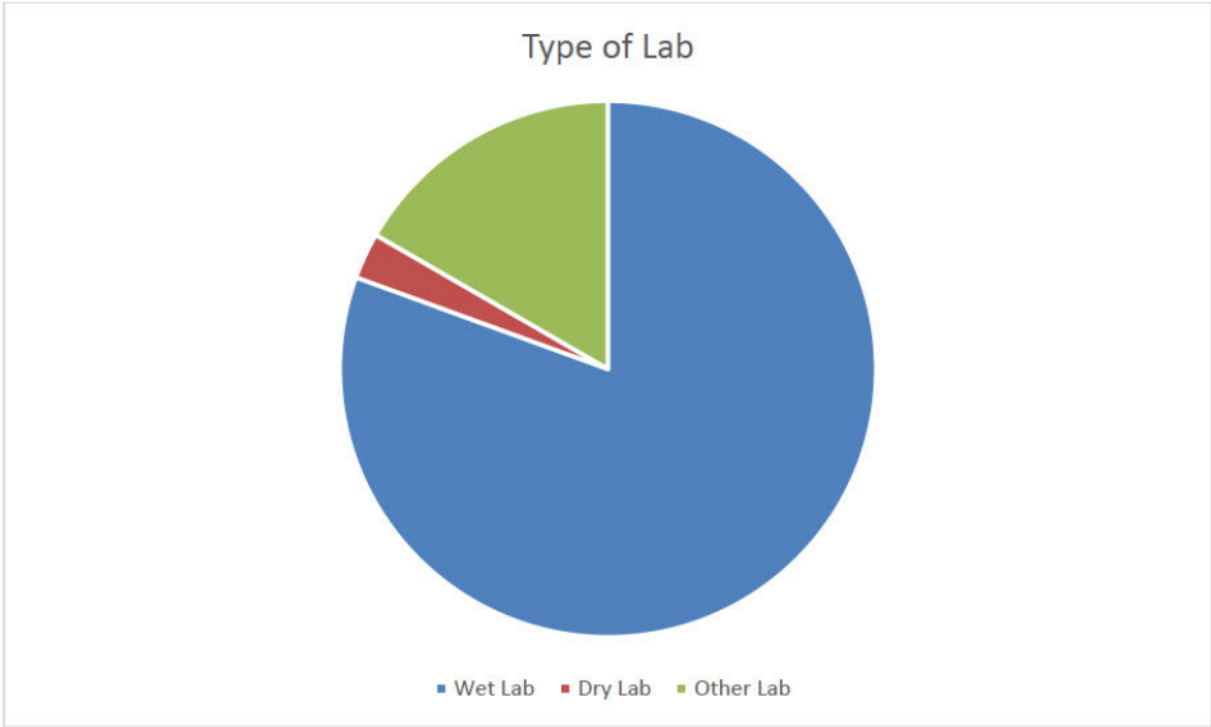


Figure 4: Type of Lab

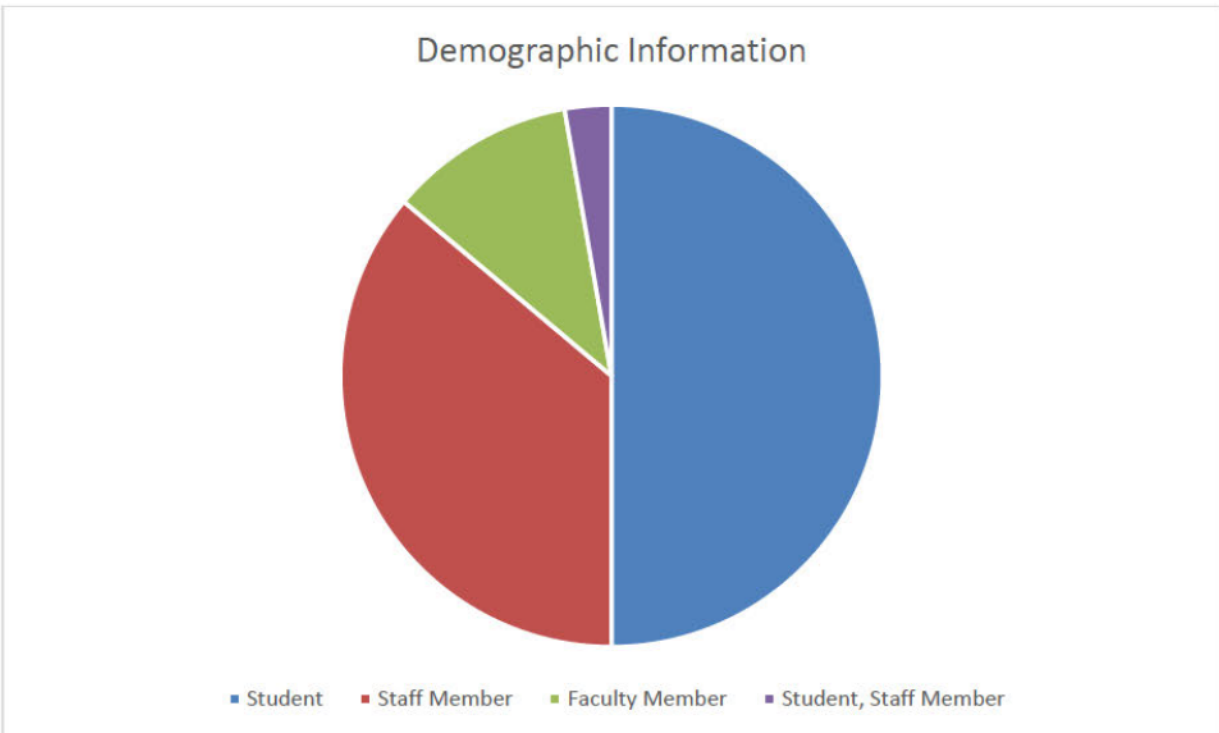


Figure 5: Demographic Information



Two additional questions were asked to determine the awareness regarding incident and near miss reporting and training in incident reporting. Of the 36 responses, 30 noted they were trained in some manner (by their supervisors, Health and Safety (H&S) department, or training from previous roles) while six responded they had no training. The incident reporting training is presented in Figure 6. Similarly, 25 respondents were aware of the requirement to report incidents and near misses (prior to the survey) and 11 noted they were not aware of the requirement to report. The awareness to report is presented in Figure 7.

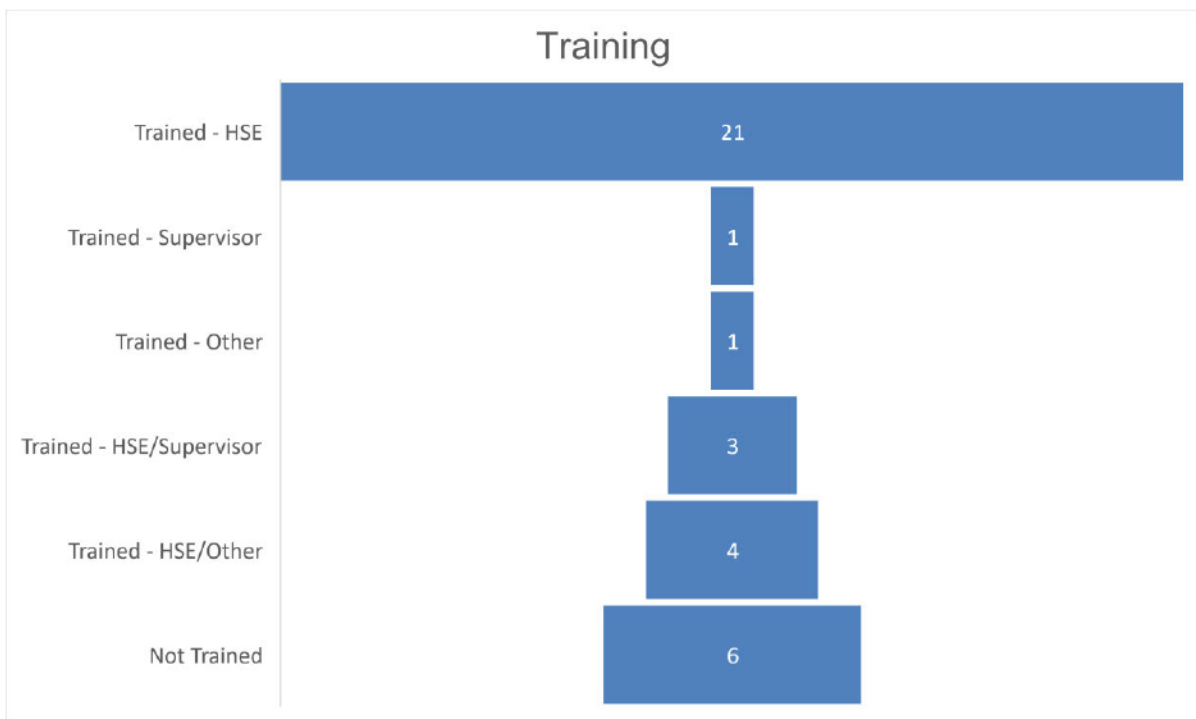
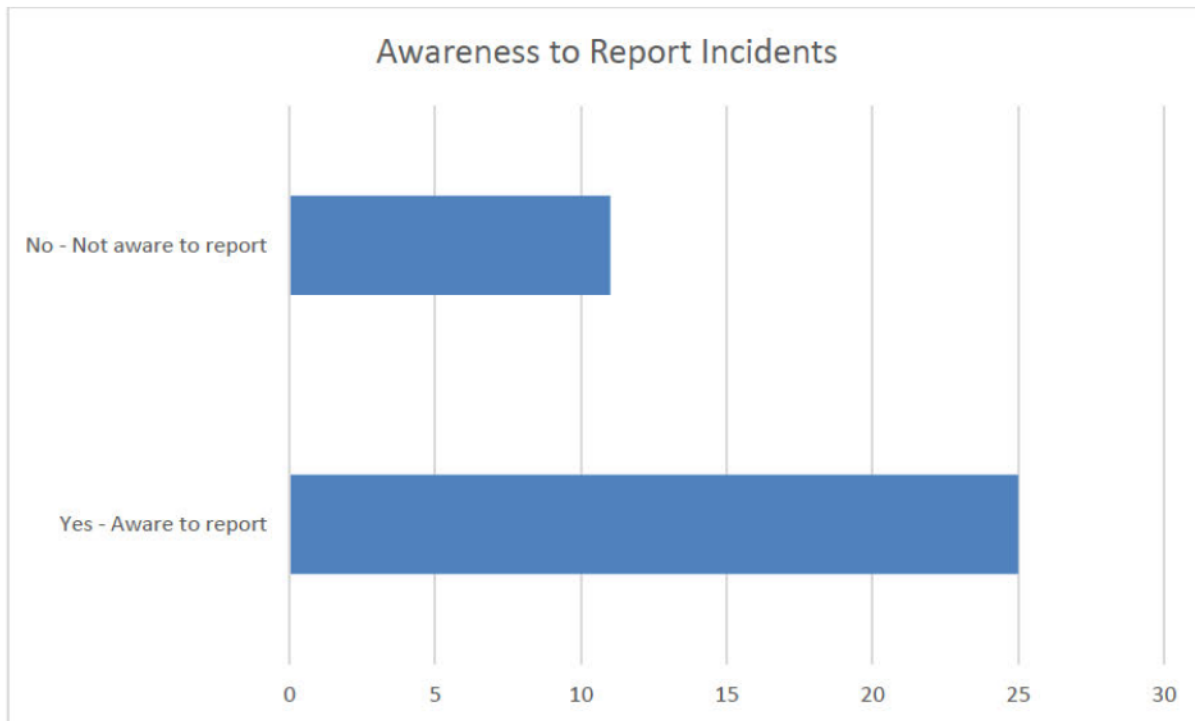


Figure 6: Training



*Figure 7: Awareness to Report Incidents*

And finally, the survey asked respondents in the past six months, how many near misses occurred in their lab (on a scale from 0, 1-2, 3-5, 5-9, or 10+) versus how many near misses were actually reported. They were also asked how many incidents occurred in the last 6 months and how many incidents were reported. The summary of these findings is available in Table 3.

*Table 3: Number of near misses and incidents that occurred and were reported.*

		Number reported by respondents in the survey				
		0	1-2	3-5	5-9	10+
<b>Near Misses</b>	Number that occurred in the lab	19	14	2	1	0
	Number reported	29	7	0	0	0
<b>Incidents</b>	Number that occurred in the lab	23	13	0	0	0
	Number reported	27	9	0	0	0

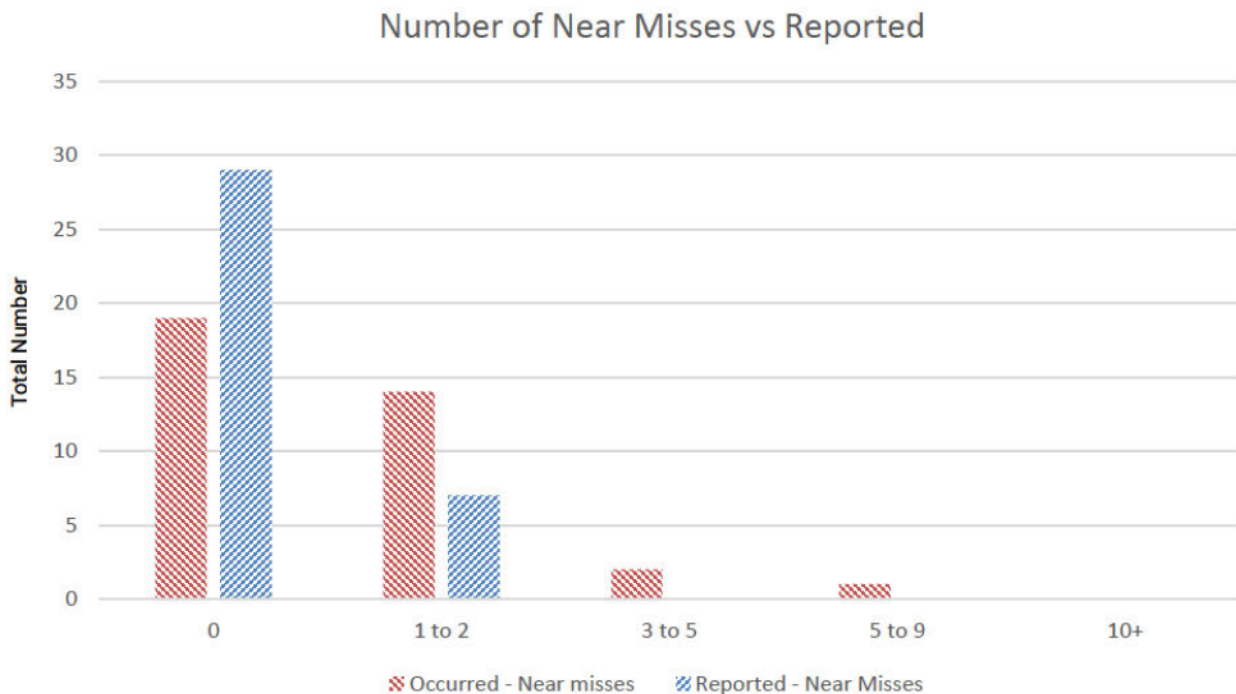
As can be seen in Table 3, ten more survey participants responded that zero near-misses were officially reported, even though they also responded that near-misses occurred in their lab. In percentage, 27.5% of respondents indicated near misses occurred but were not reported. For incidents, four survey participants responded that zero incidents were officially reported, even though they also responded that incidents occurred in their lab. In percentage, 11% of respondents indicated that incidents occurred but were not reported.

Although one participant responded that there were 5-9 near misses and two participants responded that 3-5 near misses occurred in their lab, these same numbers were not reported through the official incident reporting portal. Thirteen people reported that incidents occurred in their lab, but only nine officially reported through the incident reporting portal. Based on the survey, 4/36 or 11% percent of incidents were not reported.

Because the survey is anonymous the number of incidents that occurred versus those that were reported could not be verified. It is possible that the survey respondents were not present for all incidents that occurred in their lab. For the data analysis these survey responses will be identified that the respondent had a perceived difference in the number of near misses/incidents versus what was reported.

The survey data indicates that near misses and incidents may be under-reported. 19 of the 36 respondents indicate zero near misses had occurred in their lab in the last six months and 23 of the 36 respondents indicated zero incidents had occurred in the last six months. Using the Bird model of incident and near miss ratios, it would be expected that the majority of labs would have at least one near miss within a 6-month period. The survey was completed in November of 2021, which was at least 6-months after all laboratories could return to in-person work after the COVID-19 pandemic. Some labs may have continued to work remotely/virtually or via a hybrid model by choice.

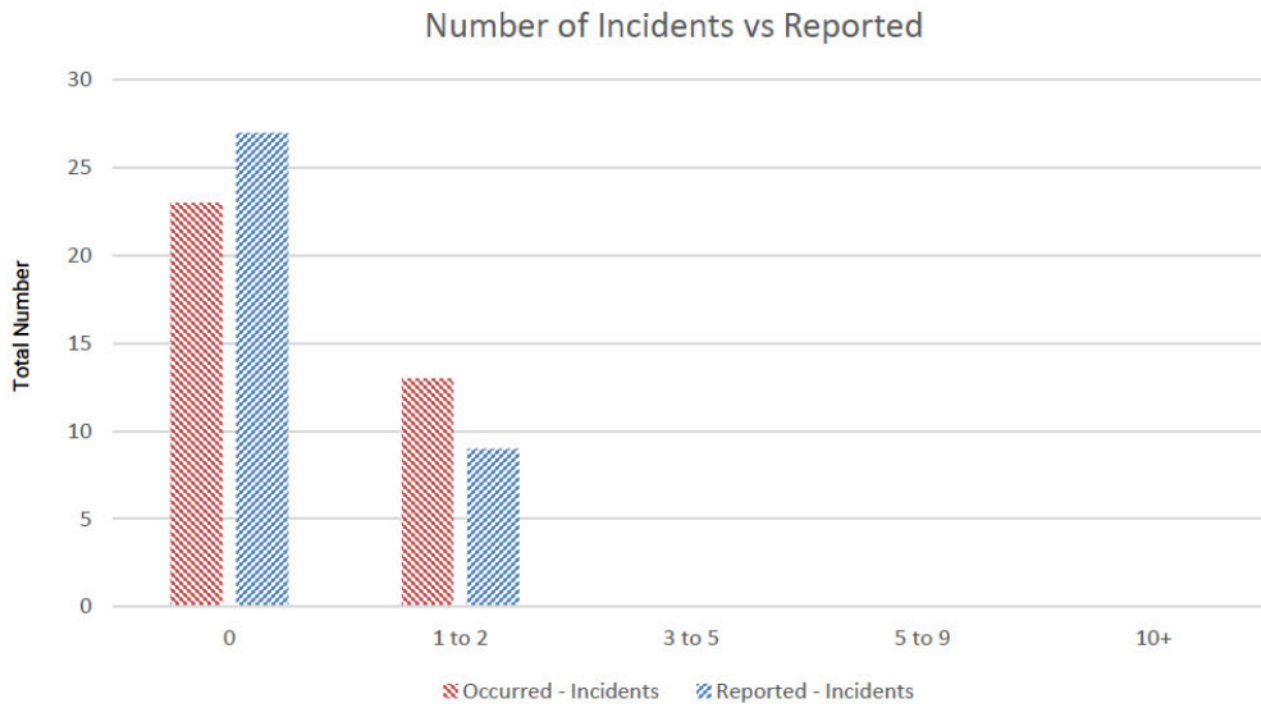
In addition, when comparing the number of near misses that occurred to the number of near misses that were reported, we can see a difference in the ratios. This is presented in Figure 8.



*Figure 8: Number of Near misses that occurred and number that were reported*

As can be seen in Figure 8, a lower number of labs reported that zero near misses occurred and a higher number of labs indicated that zero near misses were reported. In the other columns, more labs reported that near misses occurred than were reported. This indicates that near misses are happening in the labs but are not being reported.

A similar trend was identified in the incident data from the survey. Figure 9 presents the data for number of incidents that occurred versus those that were reported.



*Figure 9: Number of incidents that occurred and number that were reported*

Again, in Figure 9, it can be seen that more labs reported that incidents occurred than were reported.

When looking at the statistical analysis of the survey data, the first step was to determine the odds ratios. To do this, the data was broken down in various exposure groups. This is outlined in Table 4.

*Table 4: Exposure Groups for Odds Ratio Analysis*

	Exposed Group	Unexposed Group
<b>Role</b>	Student	Staff
<b>Trained (in incident reporting)</b>	Not Trained	Trained
<b>Experience</b>	Inexperienced	Experienced

Odds ratios also require a case group and a control group. For the purpose of this data, those that perceived a difference in occurrence versus reporting were assigned to the

case group, and those that did not perceive a difference in occurrence versus reporting were assigned to the control group. This is outlined in Table 5.

*Table 5: Case and Control Assignment for Odds Ratio Analysis*

	<b>Case</b>	<b>Control</b>
<b>Perceived Difference</b>	X	
<b>No Perceived Difference</b>		X

For the individual role, the odds of perceiving a difference in the occurrence of near misses and the reporting of near misses as a staff member were 2.36 times as high as perceiving a difference as a student. The odds of perceiving a difference in the occurrence of incidents and the reporting of incidents as a staff member were 1.5 times as high as perceiving a difference as a student.

For training, the odds of perceiving a difference in the occurrence of near misses and the reporting of near misses were the same as if they were trained or not (OR=1). The odds of perceiving a difference in the occurrence of incidents and the reporting of incidents for those who were not trained was 2.14 times as perceiving a different for those who had received training.

For the level of experience, the odds of perceiving a difference in the occurrence of near misses and the reporting of near misses were 1.27 times higher for those who were experienced versus those who were inexperienced. The odds of perceiving a difference in the occurrence of incidents and the reporting of incidents for those are experienced were 1.8 times higher than those who are inexperienced.

#### *Incident Reports 2019 – 2022*

The 2<sup>nd</sup> part of the data collection involved the incident data that had officially been reported to the institution. This data was downloaded and all personally identifying information was deleted prior to its use for this research paper. In order to compare to the survey data, only incidents from STEM Faculties with wet labs were used. A total of 658 incidents were reported between January 2019 and July 2022.

Not all these incidents occurred in labs. The STEM faculties are involved in research outside of a classical laboratory and have many staff who are not directly involved in research. As an example, incidents on slipping outside on the ice would not be directly related to research work. While these incidents will be important to the overall health and safety management program for the institution, it is out of scope for the purposes of this research. Out of the 658 incidents, 354 were not related to lab-based research work. A summary of the remaining 304 incidents is provided in Table 6. Of the 304 incidents, 22 were considered serious (lost time), 86 were minor (no lost time), and 196 did not indicate the severity of the incident.

*Table 6: Number of incidents reported by type 2019 - 2022*

Type of Incident	Number Reported
Near Miss	55
Injury/Illness	108
Environmental Release	9
Exposure to Hazardous Substance	59
Property Damage	28
Other	45
<b>Total</b>	<b>304</b>

Of the 108 incidents reported as injury/illness, the 22 serious injuries mainly involved lost-time or hospitalization. Some examples of these injuries included:

- Burns from as hot plate resulted in lost-time
- Burns from handling a cold box resulting medical-aid and lost-time
- Medical episode (seizure) in the lab causing further injury to head and arm
- Burns caused from chemical exposure resulting in lost-time
- Cart running into back of ankle requiring medical-aid (stitches)
- Broken pipette causing a cut requiring medical-aid
- Allergies cause by exposure to animals over time resulting in lost-time
- Repetitive strain injury from pipetting and computer use resulting in lost-time

- Contact with a belt sander resulting in medical-aid and lost time

Of the 28 property damage incidents, the majority were minor such as damaged equipment (hot plates, power cords, building materials from small fires or chemical spills). The major property damage incidents mainly included large fires that damaged a fume hood and surrounding materials and flood-events that caused damage in multiple laboratories, resulting in a high-cost of the damages.

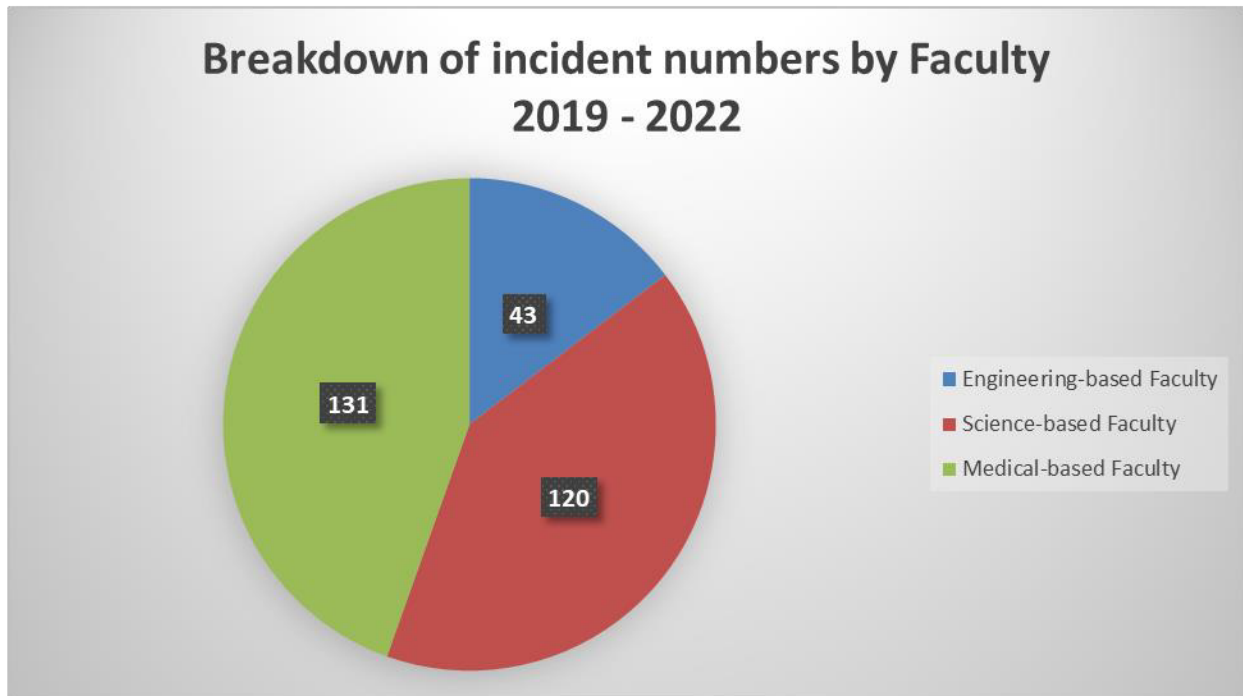
The data was then reviewed and reassessed to ensure the incidents were assigned the appropriate incident type. Where the incident type could clearly be identified in the incident description, and it was different than the reported incident type, it was adjusted to properly reflect the type of incident that occurred. Out of 45 incidents labelled “other” all 45 of them could be classified as one of the five incident types. A number of near-misses involved property damage or an injury, and some exposure to hazardous substances resulted in an injury or illness, so the incident types were changed accordingly. The only incident type that remained the same was environmental release at nine (9). In addition, 10 incidents were found to be duplicates, bringing the total number of incidents to 294. The corrected number of incident reports by type is presented in Table 7.

*Table 7: Corrected number of incidents reported by type 2019 - 2022*

<b>Type of Incident</b>	<b>Number Reported</b>
Near Miss	62
Injury/Illness	143
Environmental Release	9
Exposure to Hazardous Substance	42
Property Damage	38
Other	0
<b>Total</b>	<b>294</b>



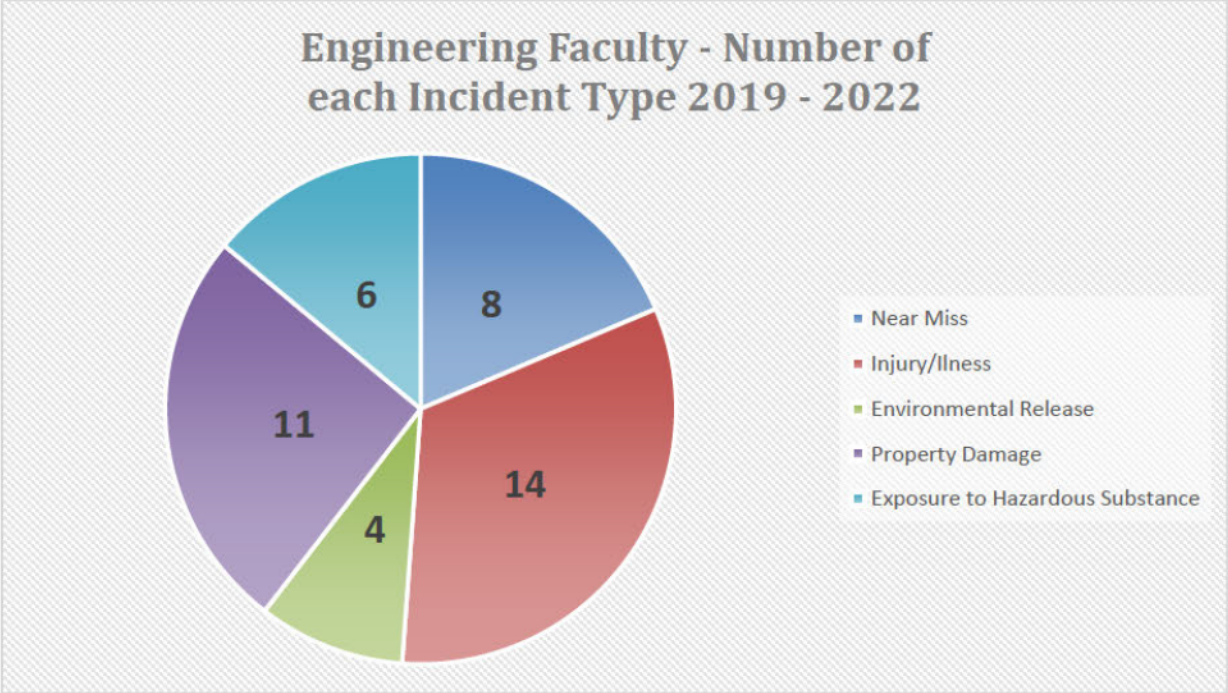
When separated out by Faculty, the majority of incidents were in the science-based and medical-based faculties. The breakdown of incidence by Faculty is in Figure 10.



*Figure 10: Breakdown of incident numbers by Faculty 2019 - 2022*

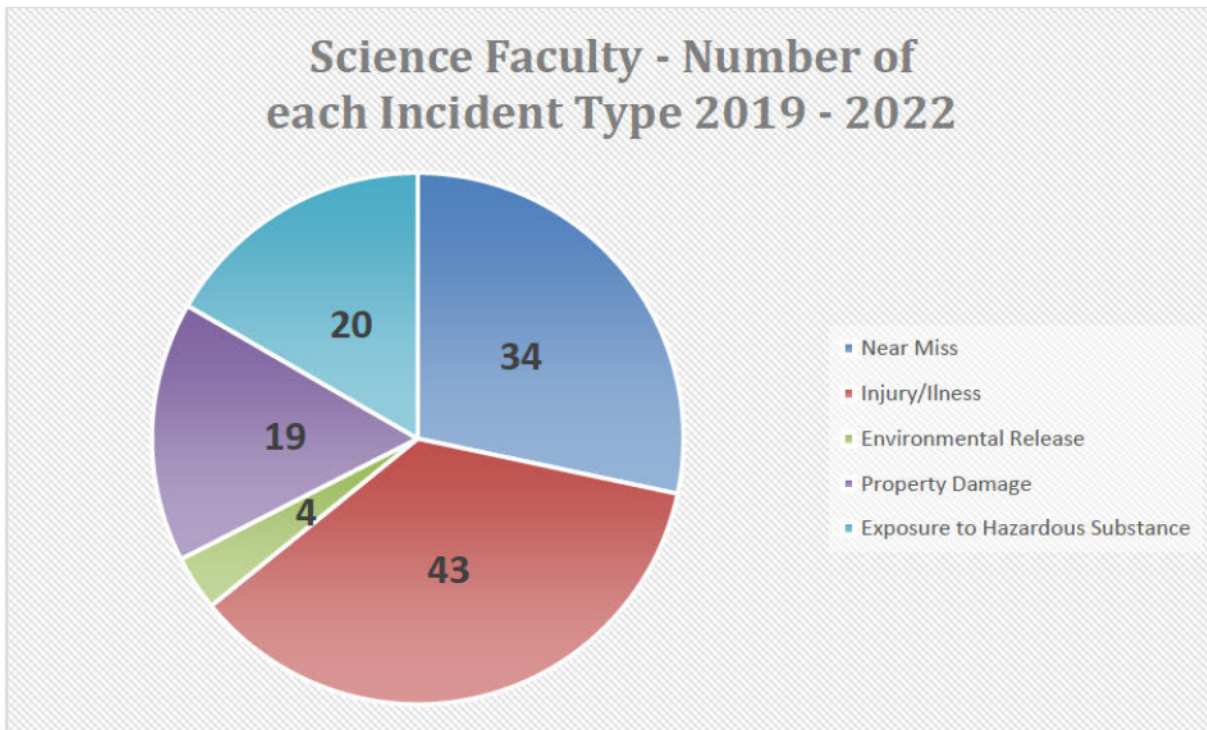
The Engineering-based faculty reported 43 incidents, while the medical one reported 131 and the science one reported 120 incidents.

When looking at each Faculty, the number of incidents can further be broken down by incident type. For the engineering-based Faculty, there were eight (8) near misses and 35 incidents. The breakdown for the engineering-based Faculty is identified in Figure 11. The majority of incidents were property damage and injury/illness (25/35 incidents).



*Figure 11: Engineering Faculty - Number of each incident type 2019 - 2022*

The science-based Faculty had a total of 120 reports, including 34 near misses and 86 incidents. The breakdown of incident types for the science-based Faculty can be found in Figure 12. The majority of incidents were property damage and injury/illness (62/89 incidents).



*Figure 12: Science Faculty - Number of each incident type 2019 - 2022*

The medical-based Faculty had a total of 131 reports, including 20 near misses and 111 incidents. The breakdown of incident types can be found in Figure 13. The majority of incidents were injury/illness (86/111 incidents).

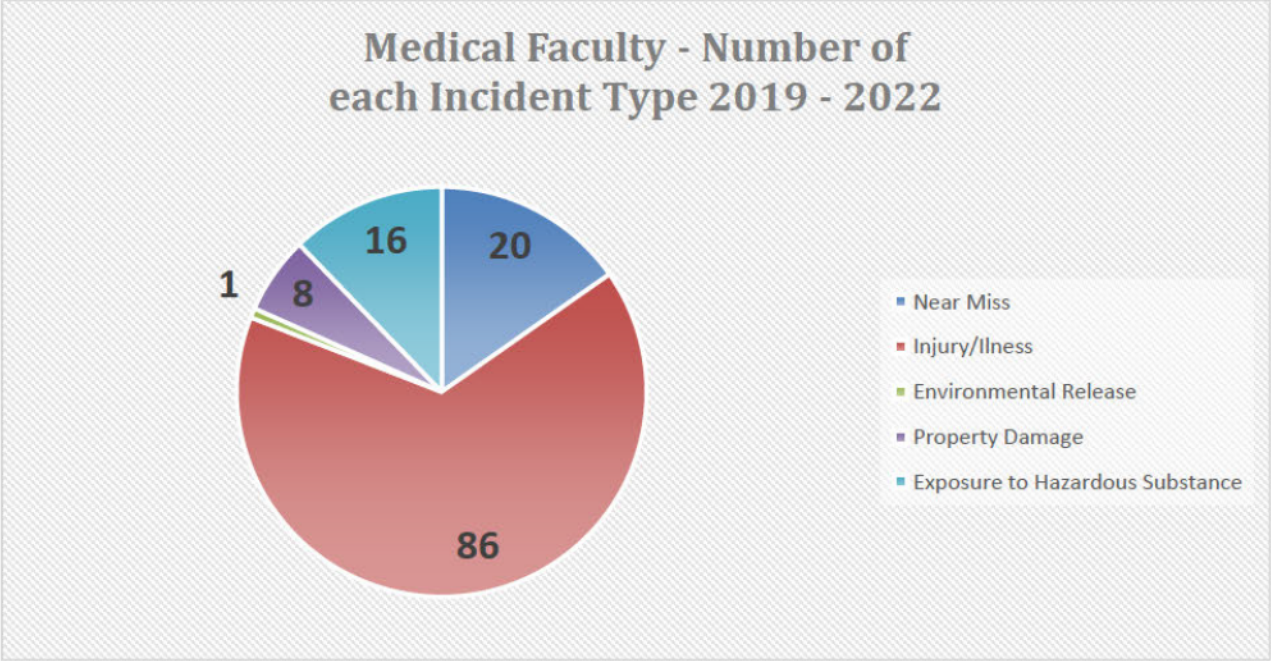
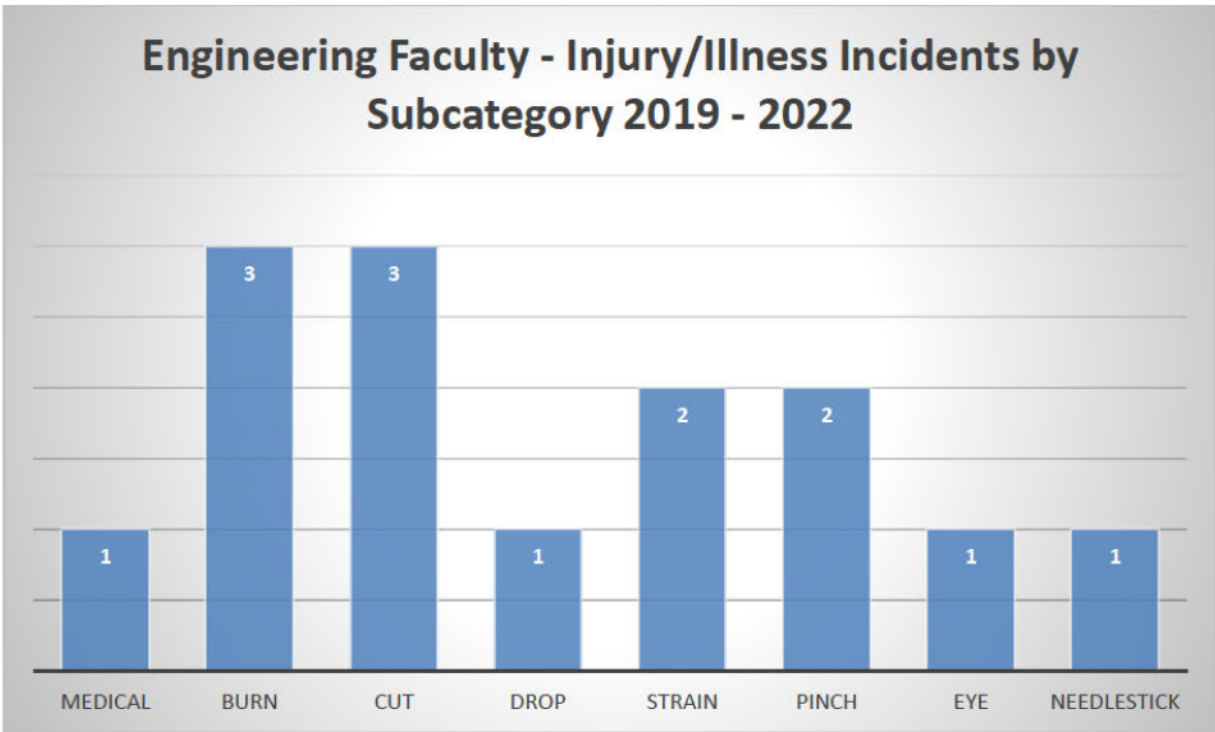


Figure 13: Medical Faculty - Number of each incident type 2019 - 2022

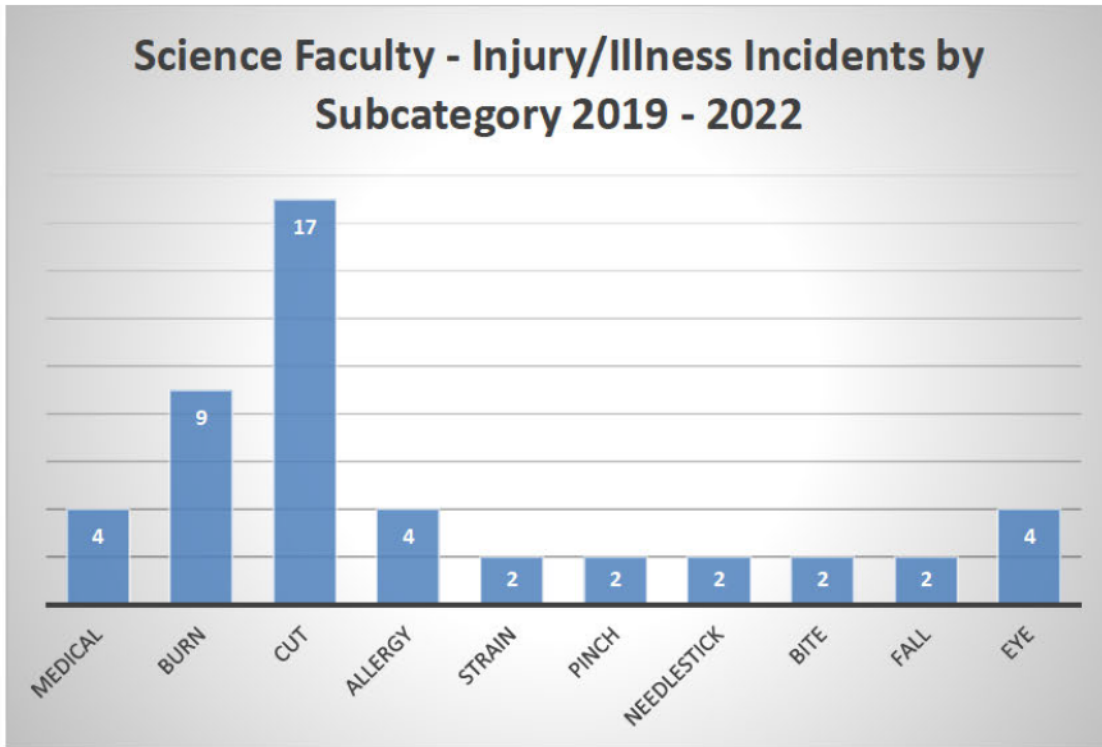
The majority of incidents were from illness/injuries, and so this incident type was broken down further to look at the subcategory of what incidents were occurring in each Faculty.

For the engineering-based Faculty, the incidents were generally spread out evenly over several categories, with each category having one to three incidents. This breakdown can be found in Figure 14. 42.8% of incidents were cuts/burns.



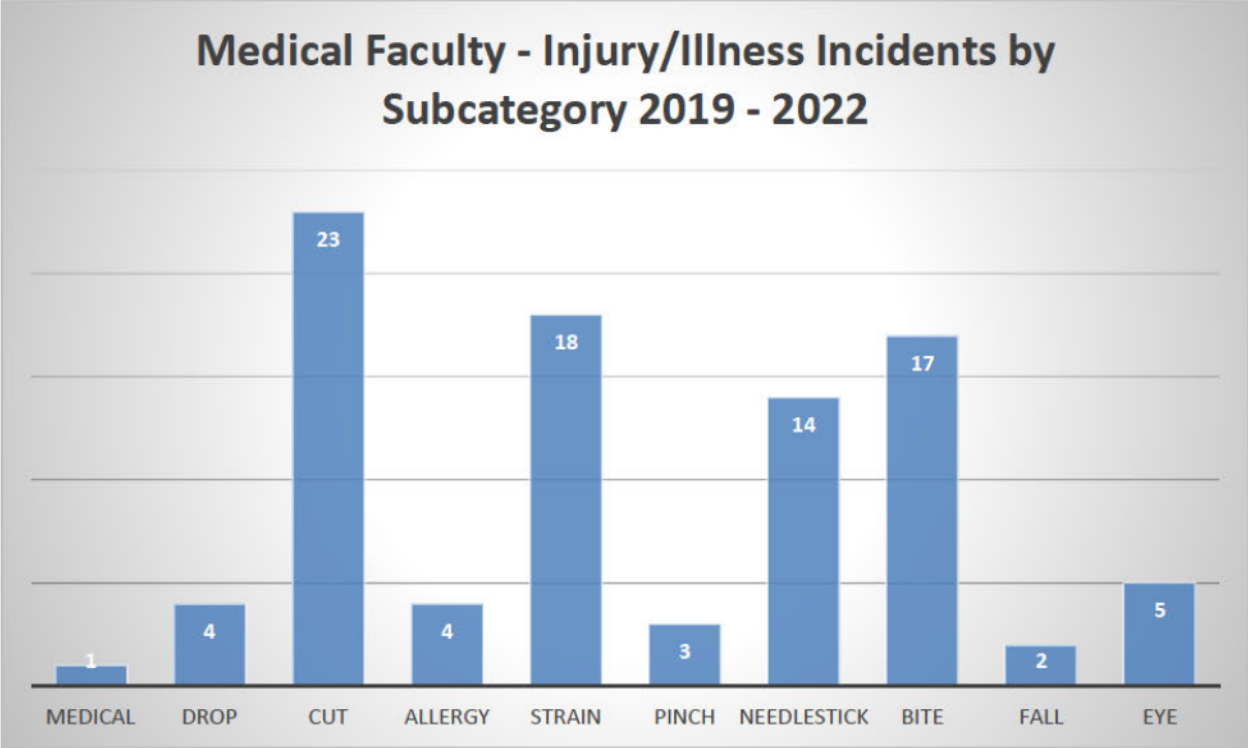
*Figure 14: Engineering Faculty - Injury/Illness Incidents by Subcategory 2019 - 2022*

In the science-based Faculty, the incidents were also spread out over a number of categories, but there were two clear subcategories that included the majority (54%) of injury/illness. These included cuts, which had a total of 17 (35.4%) incidents, and burns, which had a total of 9 (18.7%) incidents. The breakdown can be found in Figure 15.



*Figure 15: Science Faculty - Injury/Illness Incidents by Subcategory 2019 - 2022*

In the medical-based Faculty, there were 4 clear categories where the majority (79%) of injury/illness incidents fell. This includes cuts (23, 25.3%), strain (18, 19.7%), bites (17, 18.7%) and needlesticks (14, 15.4%). The full breakdown is shown in Figure 16.



*Figure 16: Medical Faculty - Injury/Illness Incidents by Subcategory 2019 - 2022*

The number of incidents for each Faculty was broken down by year. It is important to note that 2020 and 2021 include the full year, while 2022 only includes January to July 2022. There were no incidents that met the inclusion criteria in 2019 which is why there are no reports for 2019. The expected number of incidents for 2022 would be approximately double what is reported to date. The breakdown for each Faculty is available in Figures 17, 18, and 19.

### Engineering Faculty - Incidents per year 2020-2022

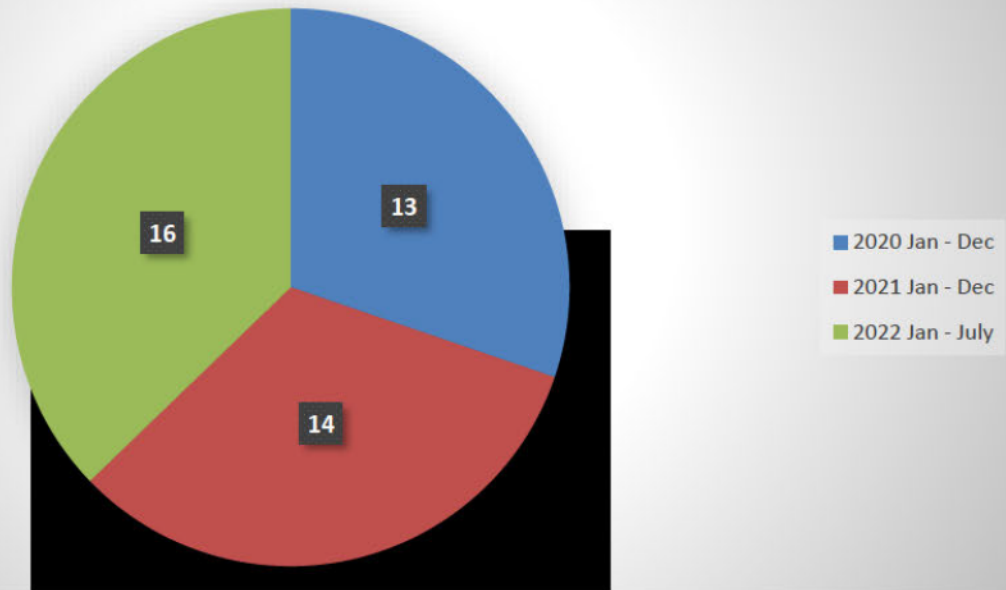


Figure 17: Engineering Faculty - Incidents per year 2020-2022

### Science Faculty - Incidents per year 2020-2022

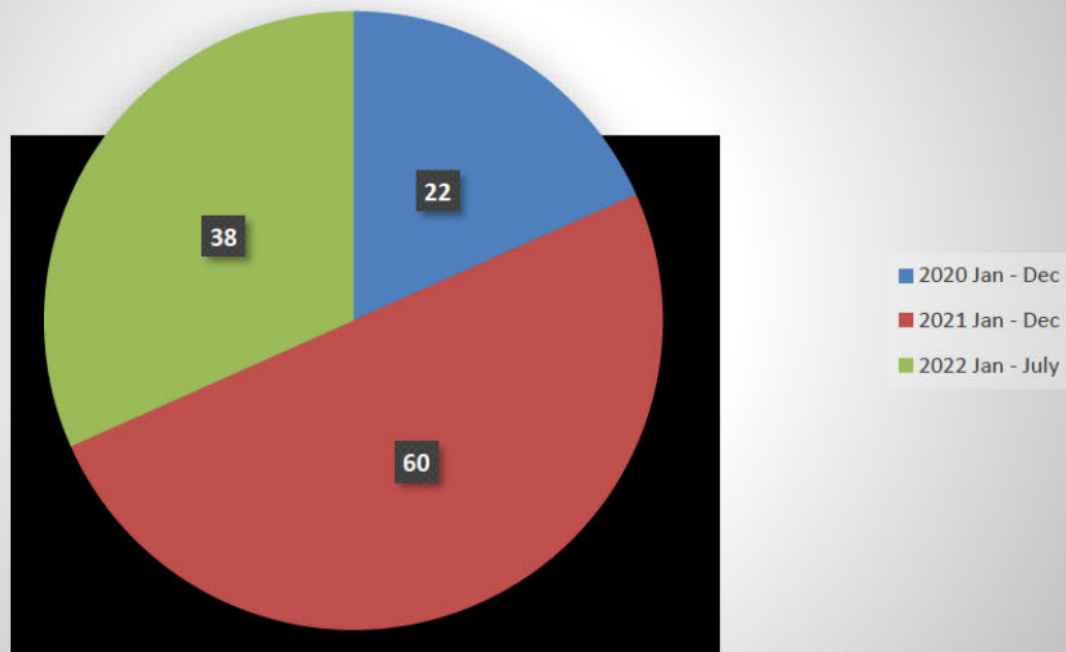
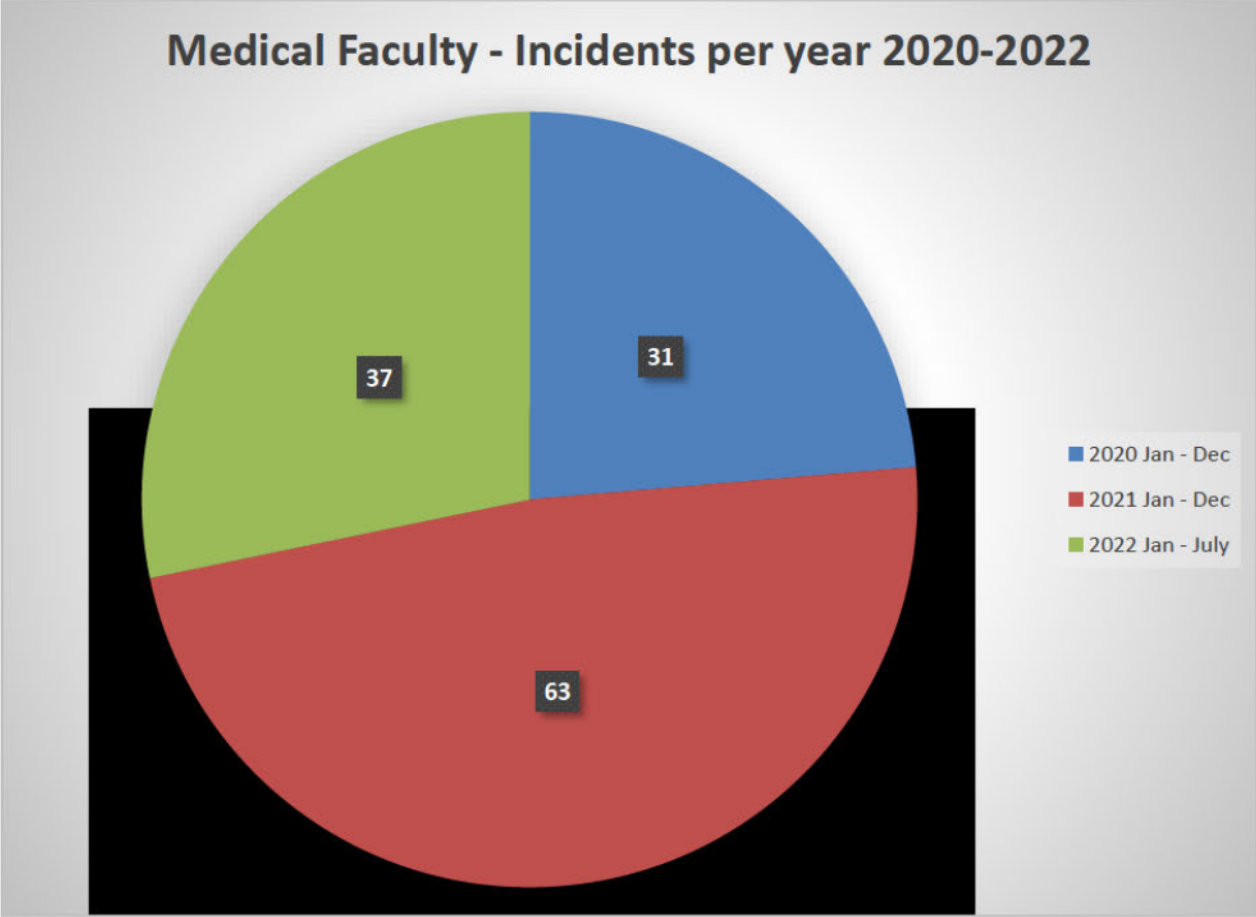


Figure 18: Science Faculty - Incidents per year 2020-2022





*Figure 19: Medical Faculty - Incidents per year 2020-2022*

A similar trend from the survey data was also identified in the actual incident data that was reported to the institution. Of the 304 reports, 62 of them were near misses and 242 of them were incidents. As a conservative estimate, assuming all 242 incidents were classified as equivalent to property damage, using the Bird Model, we would expect at least 484 near misses to be reported in the same time frame.

From the data, we know that at least 22 incidents were lost time and can classify these as serious incidents. We know 62 were near misses, and 38 property damage. There were 143 incidents identified as injury/illness, including the 22 lost-time incidents, which means 121 were minor injuries/illness. The remaining 51 incidents were classified as exposure to hazardous substance or environmental release. As these are greater than a near miss (an incident occurred) but no injury or illness was noted, they will be

classified with property damage as “non-injury” incidents. These numbers can be compared to the Bird model. This comparison is outlined in Table 8.

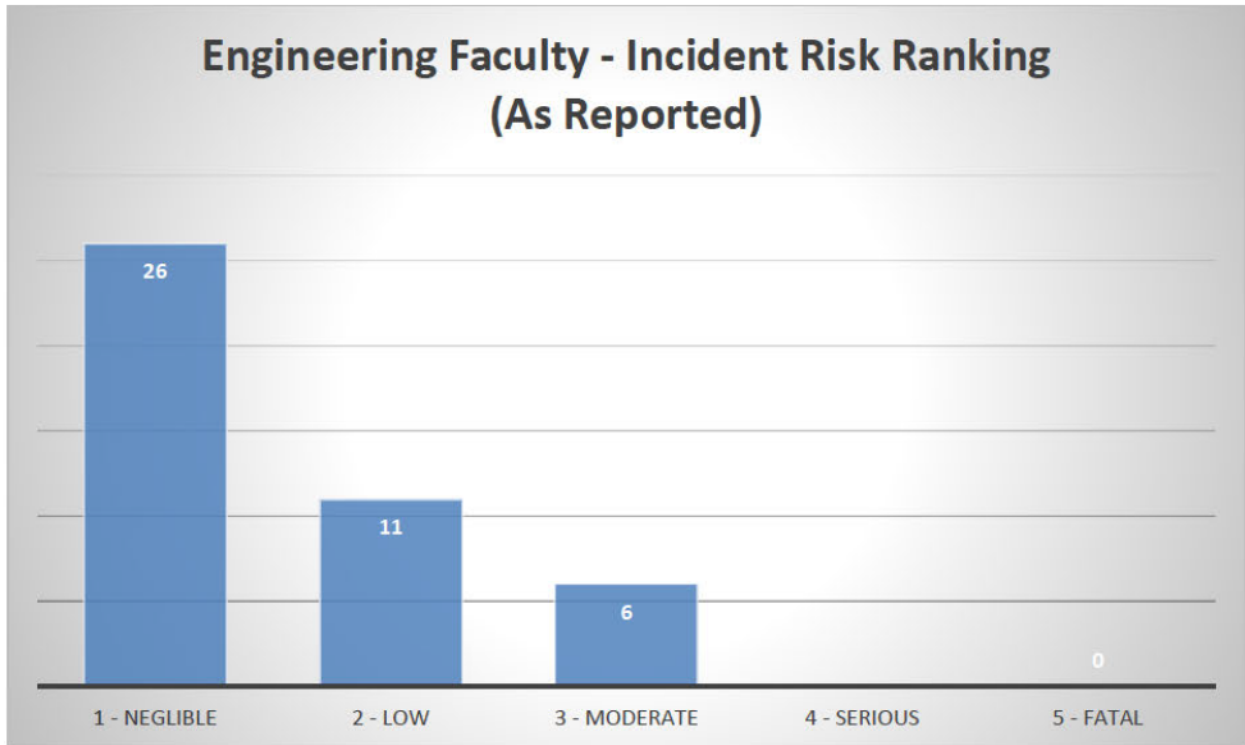
*Table 8: Comparison of Reported Incidents to Expected Incidents using the Bird Model*

Type of Incident	Actual Reported Incidents	Expected based on Serious Incidents (Bird Model)	Expected based on Minor Incidents (Bird Model)
Near-Miss	62	13,200	2,420
Non-injury and Property Damage	89	6,600	1,210
Minor Injury/Illness	121	660	<b>121</b>
Serious Injury/Illness	22	<b>22<sup>1</sup></b>	~4

*Note 1: Bold denotes the number used for estimate purposes.*

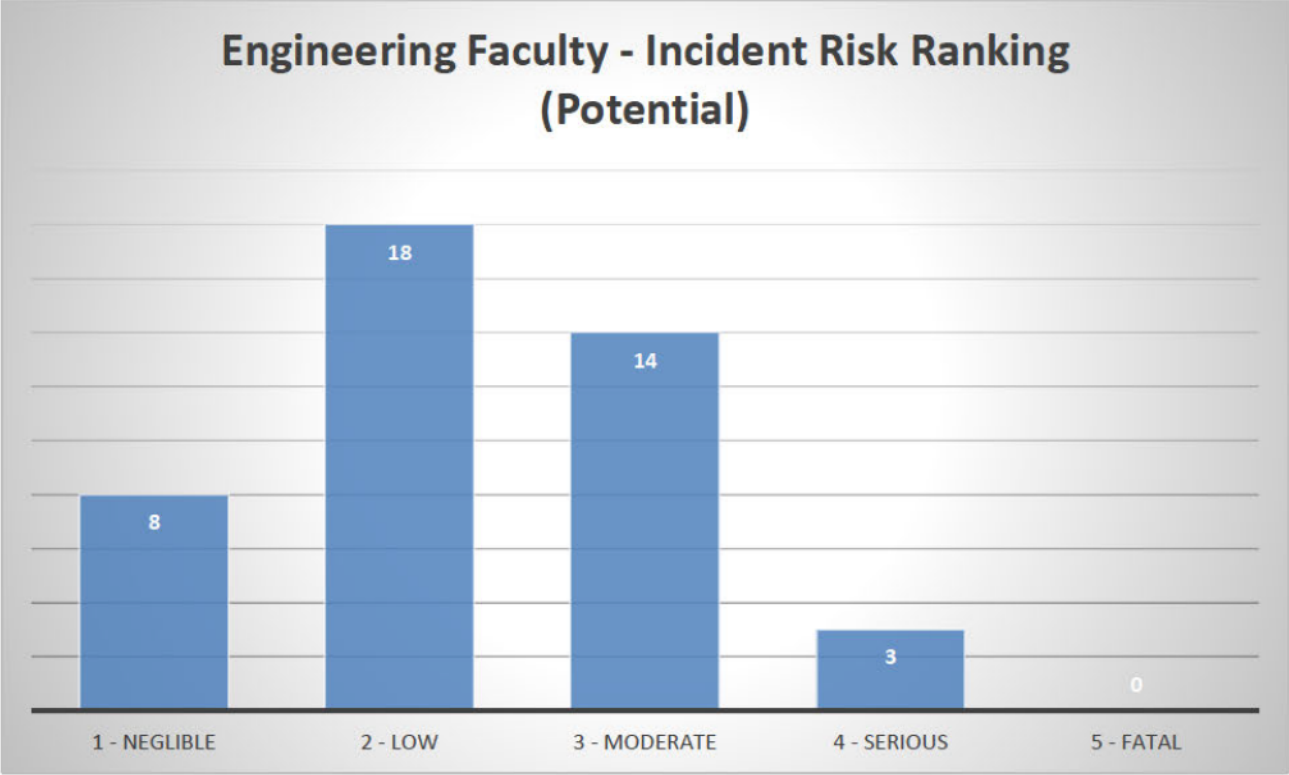
The final set of results from the exploratory analysis was looking at the risk-ranking for each incident. Two risk-rankings were generated. One was based on the incident as it occurred. The second was based on the potential outcome of the incident should conditions have been different.

For the engineering-based Faculty, there were 26 incidents ranked as a 1 (negligible), 11 incidents ranked as a 2 (low), and six incidents ranked as a 3 (moderate). These are presented in Figure 20.



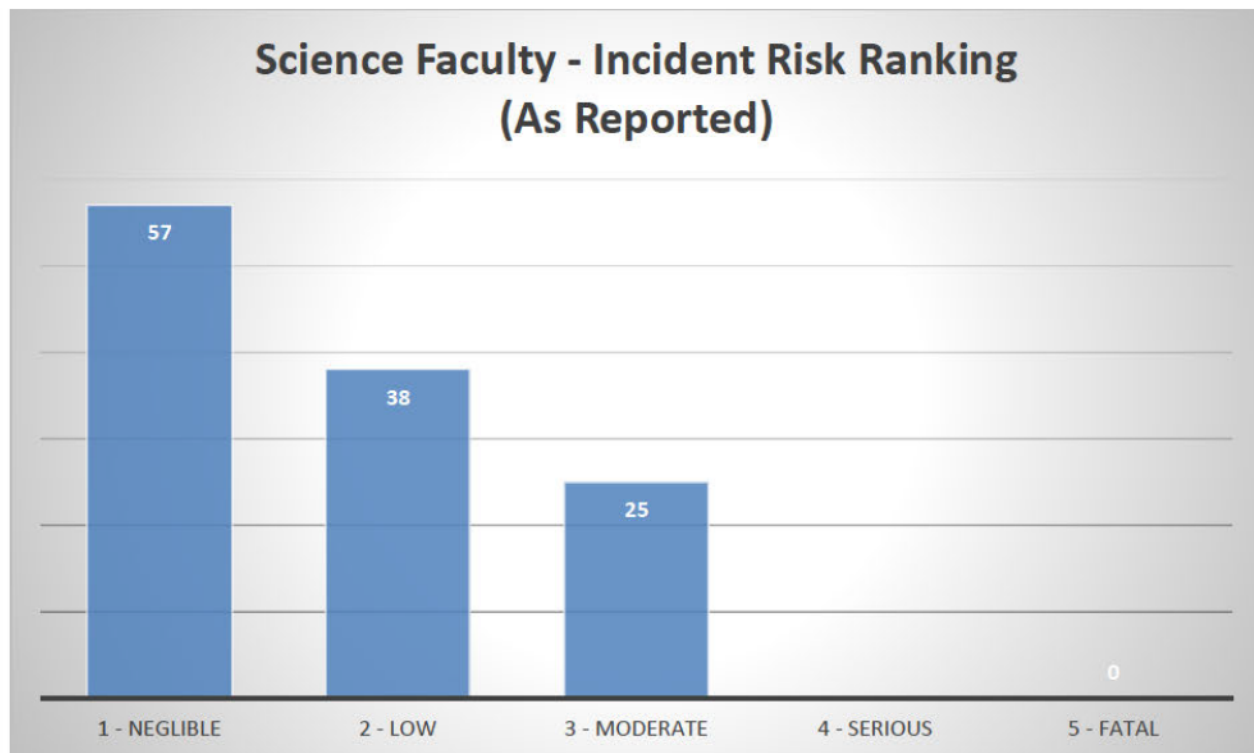
*Figure 20: Engineering Faculty - Incident Risk Ranking (As Reported)*

When assessing the potential outcomes of the incidents in the engineering-based Faculty, 8 were ranked as a 1 (negligible), 18 were ranked as a 2 (low), 14 were ranked as a 3 (moderate), and three were ranked as a 4 (serious). These are presented in Figure 21.



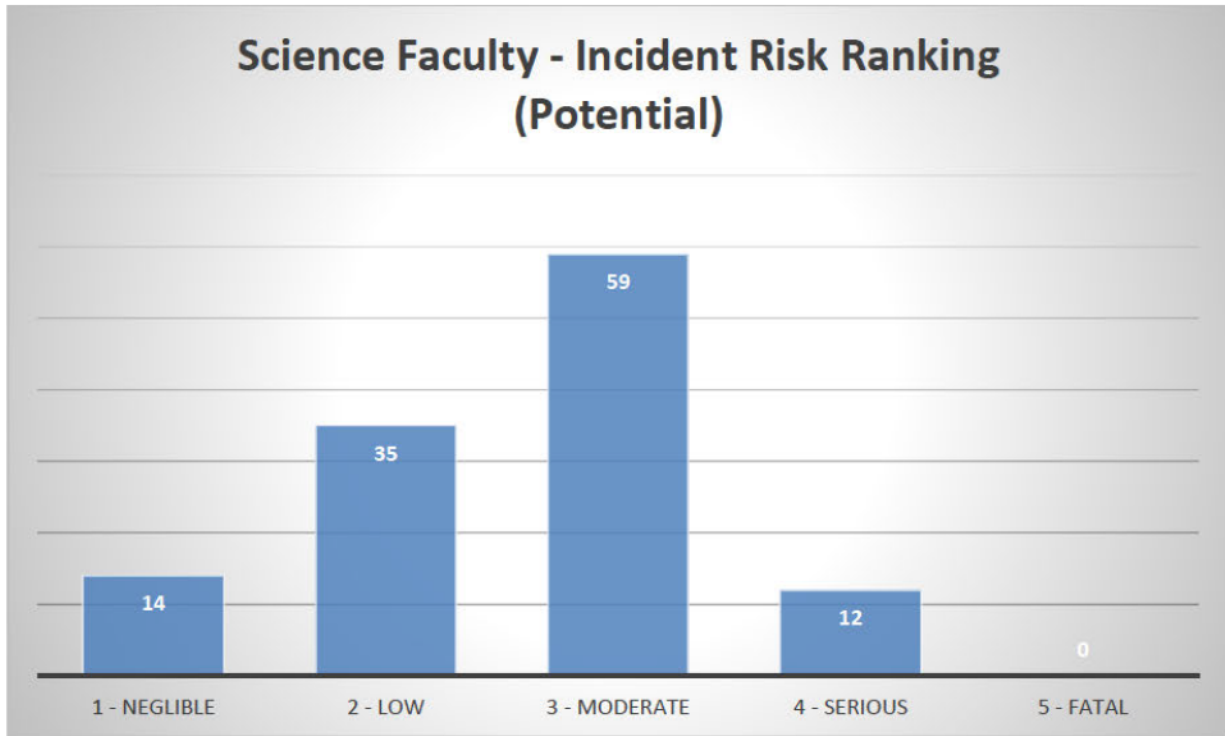
*Figure 21: Engineering Faculty - Incident Risk Ranking (Potential)*

For the science-based Faculty, the incident risk ranking found that 57 incidents were ranked as a 1 (negligible), 38 ranked as a 2 (low), and 25 ranked as a 3 (moderate). These are presented in Figure 22.



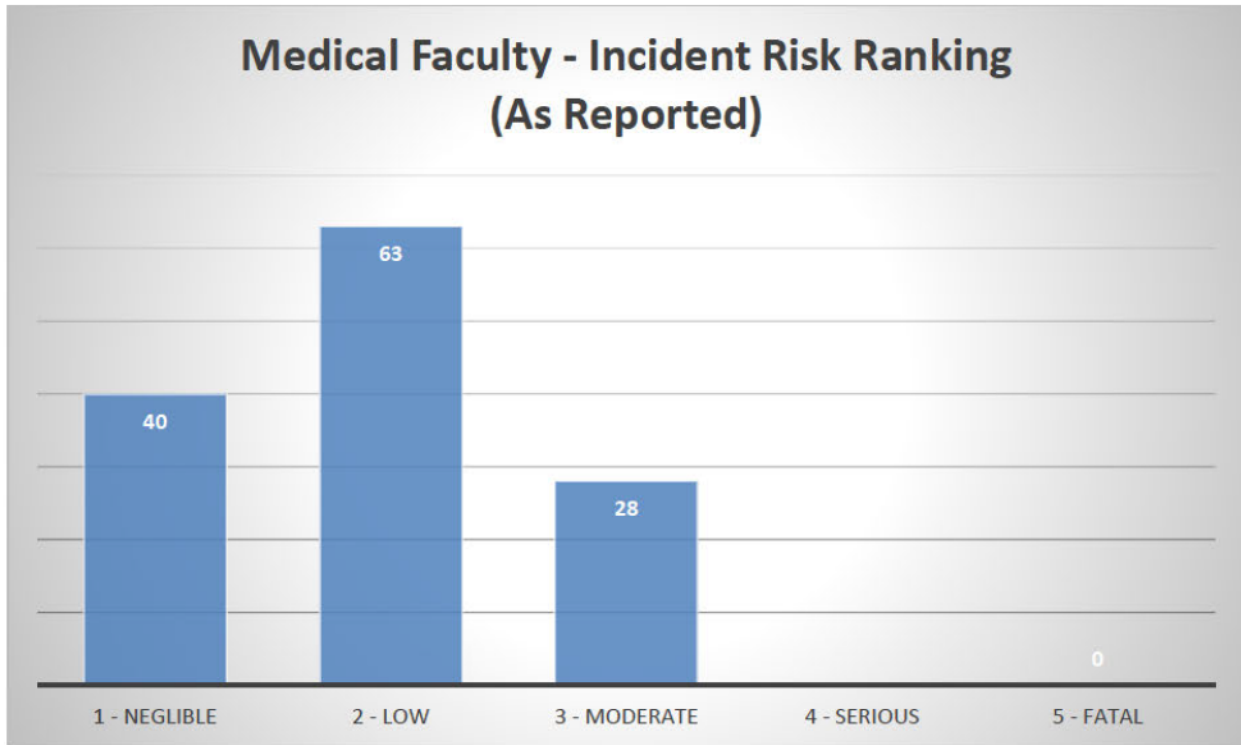
*Figure 22: Science Faculty - Incident Risk Ranking (As Reported)*

When looking at the potential outcomes of the incidents in the science-based Faculty, 14 were ranked as a 1 (negligible), 35 were ranked as a 2 (low), 59 were ranked as a 3 (moderate), and 12 were ranked as a 4 (serious). These are presented in Figure 23.



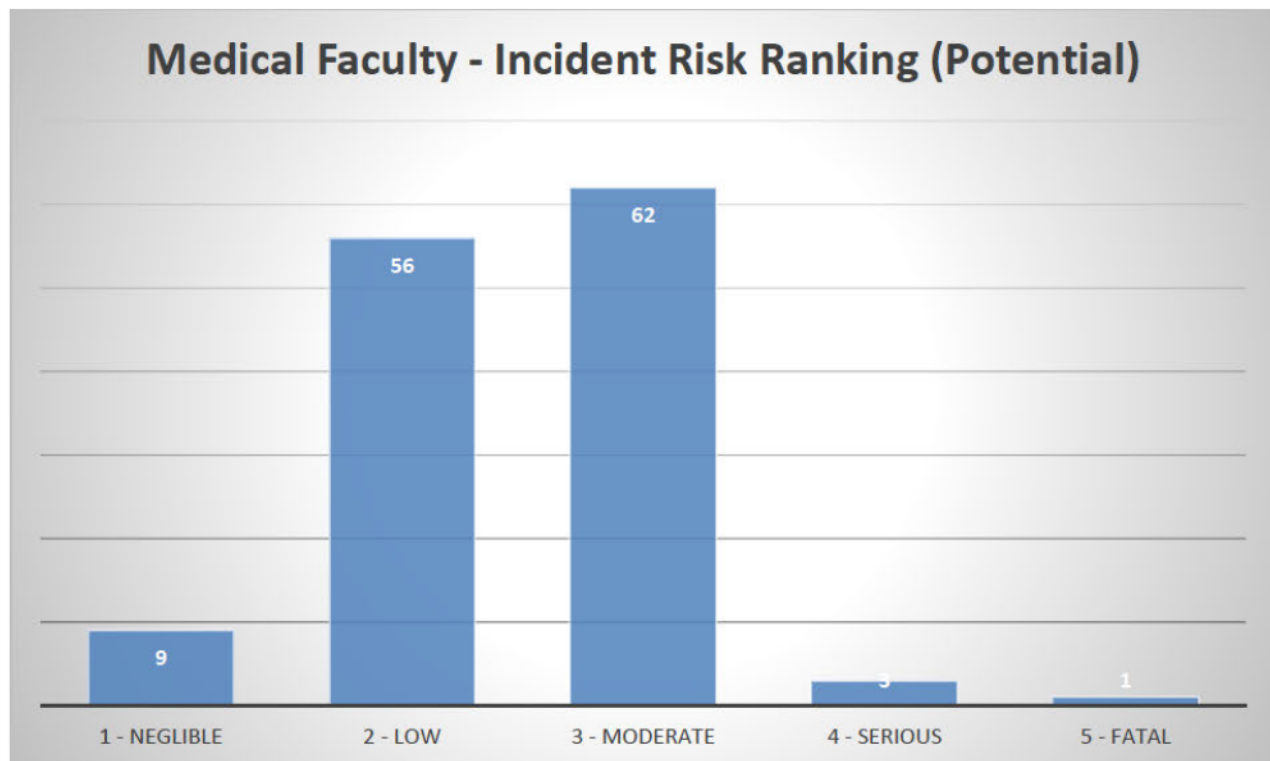
*Figure 23: Science Faculty - Incident Risk Ranking (Potential)*

For the medical-based Faculty, the risk rankings found that 40 incidents were ranked as a 1 (negligible), 63 incidents were ranked as a 2 (low), and 28 were ranked as a 3 (moderate). These are presented in Figure 24.



*Figure 24: Medical Faculty - Incident Risk Ranking (As Reported)*

When assessing the potential outcomes from the incidents in the medical-based Faculty, nine were ranked as a 1 (negligible), 56 were ranked as a 2 (low), 62 were ranked as a 3 (moderate), three were ranked as a 4 (serious), and one was ranked as 5 (fatal). These are presented in Figure 25.



*Figure 25: Medical Faculty - Incident Risk Ranking (Potential)*

For the reported incident data, statistical analysis was conducted using a Pearson’s chi-squared test the Fischer’s exact test. The data was uploaded into STATA 17 for the statistical analysis. Both tests provided a p-value of <0.001, which means we can reject the null hypothesis that there is no difference between the data sets. This means the ratio of the sample data is significantly different that the ratio of the Bird pyramid model.

In addition, the data was broken into near misses and not near misses to compare the ratio from the incident data to the pyramid model. A Pearson’s chi-squared test was run on the data. The P-value for this test was <0.001, which means we can reject the null hypothesis that the ratio of near misses to other reports was the same in both datasets. This means that the proportion of near miss reports in the incident data (18.3%) was significantly lower compared to the Bird model (63.4%).



## Chapter 4

### Discussion

Workplace incidents and injuries still occur and while limited focus has been done on academic laboratories, they are considered workplaces in most, if not all, jurisdictions in Canada and are not immune to incidents. In Canada in 2019, according to the 2021 Report on Work Fatality and Injury Rates in Canada, there were 271,806 lost-time injuries and 925 work-related deaths (Tucker & Keefe, 2021). This report uses data from worker compensation boards across Canada to collect information. This report does not include the property damage, near misses, and minor injuries (that don't involve lost-time) that are occur in organizations.

Workplace injuries are a subset of total injuries that impact Canadians. A study conducted in Ontario found that the percentage of occupational injuries as total of all injuries is declining year over year (Mustard & Costante, 2015). It has also been found that the trend over the last couple of decades is that workplace injuries are declining across Canada (Gillmore, 2021), however there have been some increases in certain provinces (Alberta, Ontario, New Brunswick, and Newfoundland and Labrador). While trends cannot be identified the increase is concerning and warrants further exploration (Gillmore, 2021).

There are a variety of factors that could potentially have contributed to this decline in incidents. With the introduction of health and safety legislation in many provinces over the last 50-60 years, the groundwork was laid for improvements in health and safety in the workplace. In the last couple of decades, there has been an increase in legislative frameworks, promotion of health and safety management, and demand from unions and workers for a safer workplace. From the Hogg's Hollow disaster in March of 1960, there has been an outcry for modernizing safety regulations to protect workers (Duzman, 2012). A brief history of Canadian OHS is outline in Table 9.

Table 9: History of OHS Actions in Canada

Date	OHS Action
1964	Industrial Safety Act in Ontario
1968	Canada Labour (Safety) Code
1972	OHS Act in Saskatchewan
1976	OHS Act in Alberta
1978	OHS Act in Ontario
1978	Canadian Centre for Occupational Health and Safety (CCOHS) is established.
1985	Day of Mourning declared
1999	Fatalities among young workers establish the Young Worker Awareness Program
2004	Bill C-45 amends the Criminal Code, imposing criminal liability for OHS violations resulting in injury or death
2004	OHS Code introduced in Alberta
2004 – Present	Various updates, changes to OHS legislation across Canada.

*Note: Adapted from Duzman, 2012 and provincial records.*

The underlying philosophy of Occupational Health and Safety (OHS) legislation in Canadian jurisdictions is the internal responsibility system (IRS) (CCOHS, 2016). The foundation of an IRS is that everyone in the workplace has responsibility for health and safety. Legislation does not always impose prescriptive steps to determine compliance, but instead holds employers responsible for determining the steps to keep employees healthy and safe (CCOHS, 2016). While OHS Acts, Regulations, and Codes have been updated over the last 2 decades, it is likely that the real efforts on the employers' part to meet these regulations, usually through the development of health and safety management systems, has helped to reduce incidents and injuries over this period.

With the injury and fatality rates plateauing and even beginning to increase in certain provinces (Gillmore, 2021), the question is how take the next steps to reduce incidents. It is unlikely that the provincial government will go further to prescribe the requirements to OHS. This means that it will be up to employers to continue to implement best practices in their health and safety management systems to further reduce the frequency and severity of incidents.

Management systems are typically based on the Plan-Do-Check-Act (PDCA) cycle (Health and Safety Executive, n.d.). While planning to prevent incidents and near misses is very important, it is difficult to predict everything that could go wrong. The check/act portion of the cycle is about continual improvement, and learnings from near misses and incidents are an important indicator to drive positive change and prevent future incidents. Reporting of these incidents is the first step because if incidents are not reported, organizations cannot complete the PDCA cycle.

Incidents and near-misses are known as lagging indicators (CCOHS, 2016). Another set of indicators, known as leading indicators, are also very important in the prevention of incidents. Leading indicators include, but are not limited to, percentage of completed training, frequency of safety meetings, and frequency of inspections and audits (CCOHS, 2016). Leading indicators can help prevent incidents by being proactive in controlling hazards in the workplace. Training and education can improve worker performance regarding health and safety, minimize their likelihood of having an incident. Inspections and audits can identify issues before they become a near-miss or incident, allowing you to correct unsafe situations before they become harmful. A balance of leading indicators and lagging indicators is needed to ensure success (Inouye, 2015).

The question on how many incidents and near miss in academic laboratories is a difficult one to answer. This research was designed to determine if the numbers being reported are reflective of the actual number of incidents and near misses occurring in laboratories. Anecdotally, it is common to hear about incidents that were never reported

(Ménard, Flynn, Soucie, & Trant, 2022). There are other anecdotal reports that in certain academic labs, if you do not have an incident, you are not doing proper research. While it is difficult to know if these adages are representative of the culture in today's academic laboratories, there is likely room for improvement in the attitude towards preventing all incidents and loss.

When looking at the data from the various STEM Faculties, specifically in labs, many trends can be found. These trends would provide some valuable insight into what types of incidents are occurring, how serious they are (or could be), and would allow an institution to prioritize resources in areas where the biggest impact could be made.

To start, looking at the total number of incidents reported, it was interesting to see the difference in the number of incidents between the engineering-based Faculty, and the science/medicine-based Faculty. The engineering-based Faculty had a lower number of incidents overall.

This could be for many reasons. The first could be the size of the faculties. The engineering-based Faculty has 21 undergraduate degree programs, and the science-based Faculty has 61 undergraduate degree programs. Both offer a variety of graduate programs. The medical-based Faculty is focused on graduate teaching and while it only has six undergraduate degree programs, there are 52 medical residency programs, 17 PhD programs, and 13 master's programs. The number of programs that are lab focused could also be a factor, with the expected number of labs in the science faculty to be higher than medicine or engineering. Another measure of size could be the number of students and staff. The engineering Faculty has over 4,000 undergraduate students, 1,500 graduate students, and over 2,700 staff members. The science Faculty does not list its number of students but has over 3,200 staff members. The medicine Faculty over 1,000 undergraduate students, over 1,500 graduate and post-graduate students, and over 1,800 staff. While it is impossible to compare different faculties as they are structured differently to meet their academic goals, there is little evidence to support a major size difference between the faculties.

Similar to the size of each Faculty, it could be based on the total number of laboratories. There was no available information on the total number of labs in each Faculty. If the engineering-based Faculty had fewer wet labs but more dry labs (computer-based labs), this could account for the difference in the number of incidents. But without the information not possible to tell.

Another reason could be the safety culture in each Faculty. While there was no way to measure the safety culture of each Faculty for the purposes of this research paper, certain factors that point to a strong safety culture could be used. The engineering-based Faculty, for example, has a 39-hour course specific on risk assessment and mitigation which all undergraduate students are required to take. In addition, the engineering-based Faculty has a dedicated website specifically for safety which ties directly into the institution's health and safety requirements. The science-based Faculty has no course requirements specifically around safety although some programs do include health and safety in individual courses, and has no dedicated website at the Faculty level for safety. There are department websites for safety. The medical-based Faculty also has no course specific to safety (similar to the science Faculty, some programs do include safety information), and no dedicated website for safety resources. Individual departments/programs may have safety resources on closed sites, such as an intranet, but this was not available for review.

Another interesting trend was the number of incidents per year in each Faculty, as indicated in Figures 17, 18, and 19. As can be seen, there were a much larger number of incidents in 2021 vs 2020. And 2022 was on track to have a similar number of incidents as 2021, given that it had approximately 50% of the incidents from January to July.

The number of incidents in 2020 was likely biased low for several reasons. The first is that the new incident reporting system was introduced in 2019 at this institution and there is potential that incidents were still not being reported in the new system. This also explains that we did not have reported incidents that matched the inclusion criteria for 2019.

In addition, in December 2019 was when the SAR-COV-2 virus was identified, and in March 2020 the COVID-19 pandemic began (Canadian Public Health Association, 2021). Across the country, the pandemic caused many organizations, including post-secondary institutions, to cease non-essential in-person operations. At this university this included laboratory research that was deemed not critical. While some laboratories remained active through the entire pandemic, most shut down the lab research and continued work from a remote location or virtually for at least two months.

The full shutdown lasted from approximately March 2020 until May 2020. This shut down was based on provincial health restrictions and the institutions implementation of various public health measures to minimize transmission on campus. It should be noted that even though a return to in-person was allowed, some laboratories did continue to work remotely (or hybrid remote/in-person) until July 2022 when the incident data was downloaded from the reporting system. This means there are a fewer people in labs that prior to the COVID-19 pandemic.

The COVID-19 pandemic might have had other impacts on incident reporting. In some cases, the increased awareness of safety protocols to protect against SARS-COV-2 transmission have reduced the likelihood of incidents occurring. It also may have created a state of hypervigilance around incident reporting, although there was no evidence in the incident reporting data to support this conclusion. In contrast, the pandemic and concerns of SARS-COV-2 transmission may have reduced the likelihood of people reporting incidents, for fear that they may get told they cannot continue their research. This could have impacted their grants/funding, their career propositions, their educational path, and after the large impact in 2020 where the majority of research was shut down, many researchers may have felt they did not want to go through that again. This is always a challenge in incident reporting, where employees and supervisors fear the repercussions of admitting something happened in their work area.

Based on the factors noted, it is expected that the biggest impact from the remote work would have affected the number of incidents reported in 2020. It is also possible that

the total number of incidents in labs were reduced in 2021 and 2022 due to some labs continuing to work remotely, either full-time or part-time.

Other interesting trends were noted in the individual faculties. Starting with the engineering-based Faculty, the types of incidents were relatively spread out with injury/illness being the highest at 14, and property damage right behind at 11. There were only 8 near misses, 6 exposures, and 4 environmental releases reported from Jan 2020 to July 2022.

When looking at the subcategories for injury/illness incidents, those were also relatively spread out. Burns and cuts were the most common (3 each), strains and pinches were next (2 each), and eye injuries, needlesticks, and medical episodes were the least common (1 each). This is in line with the type of work that an engineering Faculty does. The low number of incidents, and consistent number of incidents across the subcategories could indicate a strong safety culture where hazards are properly assessed and controlled. However, it could also indicate that not all incidents are being reported, especially since there were only 8 near misses reported.

In addition to the types of incidents, the trends in the risk ranking of incidents also provides additional information. The comparison of the real incident risk-ranking and the potential incident risk ranking is presented in Table 10.

*Table 10: Engineering Faculty Risk Ranking Comparison (As Reported vs Potential)*

<b>Risk Ranking</b>	<b># of each Risk Ranking (As Reported)</b>	<b># of each Risk Ranking (Potential)</b>
<b>1 - Negligible</b>	26	8
<b>2 – Low</b>	11	18
<b>3 - Moderate</b>	6	14
<b>4 – Serious</b>	0	3
<b>5 - Fatal</b>	0	0

When looking at the risk-ranking of the incidents in the engineering Faculty, the majority of incidents were negligible or low (86%) given the circumstances of the actual incident, the numbers were much different based on the potential outcomes that could have occurred. Looking at the potential outcomes, 40% had the potential to be moderate or serious incidents if conditions were different.

One example of such an incident is an employee getting a small piece of metal in their eye because they were not wearing safety glasses while grinding. Had the metal piece been larger or had it caused permanent damage to the eye, this incident could have easily been serious and debilitating to the employee. Another example was a cutting laser being set up and left unattended for 15 minutes. This was caught by another employee and while it was a near-miss, this event could have led to serious property damage or significant injury if something occurred while it was unattended.

In the science-based Faculty the most common incident was injury/illness (43) with near miss (34) in second. Exposure (20) and property damage (19) were close in number and environmental release only had 5 incidents. Looking at the data, it can be seen that near misses made up 28% of the total reports while incidents made up 72%. It would be expected that many more near misses should be being reported so this does indicate potential or serious under reporting in this Faculty.

When looking at the subcategories for injury/illness, cuts were a clear leader with 17 out of 43 incidents (40%). Burns was the next category with the most reports at nine (21%). These two incident subcategories made up more than half of the total incidents in the science Faculty. The remaining incidents were relatively evenly split with allergies, medical, and eye incidents (four each) and strains, pinches, needlesticks, bites, and falls (two each).

When looking at the risk-ranking for the incidents a similar trend was found in the science Faculty. based on the actual incident conditions, 79% of the incidents were in the negligible or low categories. Looking at the potential for incidents to occur, 59% of



the reports had the potential to be moderate or serious if conditions were different. This is presented in Table 11.

*Table 11: Science Faculty Risk Ranking Comparison (As Reported vs Potential)*

<b>Risk Ranking</b>	<b># of each Risk Ranking (As Reported)</b>	<b># of each Risk Ranking (Potential)</b>
<b>1 - Negligible</b>	57	14
<b>2 – Low</b>	38	35
<b>3 - Moderate</b>	25	59
<b>4 – Serious</b>	0	12
<b>5 - Fatal</b>	0	0

There were 12 incidents that had the potential to be serious incidents causing debilitating injuries/illnesses to staff. Three of these were allergy related, in which staff developed allergies at work. Three involved chemical incidents that either had the potential to cause serious injury or serious property damage (from a chemical reaction/fire). One involved a fall which could have resulted in severe bodily harm. Five were property damage incidents that could have resulted in severe property damage from fires or floods. For example, a minor incident involving contact with a hot plate and melted/burnt material could have resulted in a major fire causing significant damage.

In the medical Faculty, there were a total of 131 incidents and the majority of them were injury/illness (86/131 or 66%). 20 were near misses, 16 were exposures, eight were property damage, and one was an environmental release. It would also be expected in this Faculty, given the number of incidents, that we should see a significantly higher number of near misses being reported.

Looking at the subcategories for injury/illness, four categories stand out as the most common. Cuts (23), strains (18), bites (17), and needlesticks (14). The remaining incidents were classified as eye (5), dropped object and allergies (four each), pinch (3), fall (2), and medical (1).

It is interesting to note that the majority of these incidents were physical injury to the skin (cuts, bites, and needlesticks), which is expected amongst a medical Faculty that works with both human and animal participants. Scalpels, needles, and animal bites are probably the most common “sharp” objects in the Faculty, versus engineering and science that might use more tools or equipment that involves sharps. In addition, many tools and equipment would have built in protection (guards, self-retracting blades, etc...) where scalpels and animals can have no such built-in protection. Engineered needles can be used to minimize the risk of a needlestick and should be used in all medical workplaces as per the provincial OHS Code.

When looking at the risk-rankings of incidents in medical faculties, the majority (79%) were in the negligible or low category based on the actual conditions. However, when looking at the potential of each incident, this shifted with approximately half (50.4%) having the potential to be moderate, serious, or fatal. This comparison is presented in Table 12.

*Table 12: Medical Faculty Risk Ranking Comparison (As Reported vs Potential)*

<b>Risk Ranking</b>	<b># of each Risk Ranking (As Reported)</b>	<b># of each Risk Ranking (Potential)</b>
<b>1 - Negligible</b>	40	9
<b>2 – Low</b>	63	56
<b>3 - Moderate</b>	28	62
<b>4 – Serious</b>	0	3
<b>5 - Fatal</b>	0	1

Of the three incidents that had the potential to be serious, two were allergy related. The remaining potentially serious and the single incident that had a high potential to be fatal were both chemical related. These types of incidents need to be taken extremely seriously. This institution did run a campus-wide safety initiative based on the serious chemical incidents to identify and remove the hazard from the labs in question.

As can be seen from the results and data analysis, there is evidence to support that not all near misses and incidents are captured in the reporting system. In addition, there are many trends to be found in analyzing the available incident data. The incident data could be compared year over year to see if there are a similar number of incident trends in each year. In general, it would be expected that the incident numbers would rise sharply as the institution normalizes reporting of all incidents. Once the institution is confident they are capturing the majority of incidents, they should see similar number of incidents year over year, or a decline in incidents as new safety initiatives are introduced.

The trending by type of incident and subcategory also provides useful insight. This type of trending can identify those problem areas where a number of incidents are occurring. These trends have their limitations, however. For example, while it is important to reduce the incidents from animal bites, in general, these incidents are relatively low-risk. Focusing limited resources on reducing incidents that have little impact beyond first aid may not be the most efficient or effective way manage risk to improve safety.

The more effective way would be using a risk-ranking criteria, such as the one developed by this institution. A risk-ranking criteria allows you to assess the risk of an incident based on the outcome, and also assess the potential risk of how bad an incident could have been. By conducting this type of analysis, an institution could focus resources on the high-risk activities to reduce the risk of serious harm to staff. This approach would be much more beneficial than preventing minor incidents that don't have any potential to be seriously harmful.

From this review a number of potential recommendations arise. While these recommendations will be specific to the institution provided the data for this research, the general findings will likely apply to many post-secondary institutions across Canada.

The first recommendation is to improve incident reporting in all laboratories. Without a clear understanding of the number of incidents that are occurring, it is difficult to

determine where resources are needed to improve health and safety for employees.

Incident reporting needs to be about learning from the incident including:

- What happened during the incident?
- What happened prior to the incident?
- What could have happened if conditions were different? How bad could it have been?
- What can be done to prevent future incidents of a similar manner?
- What were the underlying root causes of the incident?
- What management system elements had weaknesses associated with the incident?

These learnings should be shared broadly across the institution, or if possible, across other institutions, to ensure others can learn from the incidents that occurred. This sharing is especially important for those near misses or low-risk incidents that could have been much worse. If we do not learn from them when the risk is low, the next time it could be much more significant, up to including serious injury or a fatality.

How can incidents reporting be improved? An article was recently published in Chemical & Engineering News Magazine titled “How to Capture and use near-miss lab-incident reports in Academia (Rommel, 2022). The steps can be summarized into four general steps.

1. Building a System
2. Lowering the Reporting Barrier
3. Responding to Build Trust
4. Creating Lasting Change (Rommel, 2022)

Building a system is simply having an online reporting systems for every department on campus. This system should include the ability to report safety concerns, near misses, and can also be tied into the actual incident reporting system. One system outlined in the article known as “Safety Concerns and Near Misses” (SCAN), allows anyone to

submit a narrative description and photos of a situation that poses a safety concern (Rommel, 2022).

Lowering the Reporting Barrier is about ensuring that the system is both useful and used regularly. Researchers cannot use the system if they do not know it exists, thus promoting, training, and educating staff about the system is important. Another common concern is whether it is non-threatening to file a report. A researcher may not feel comfortable to report an incident if they feel they may be punished for filing it, or if it might impact their academic research in some way. For example, a researcher who is concerned with a tight deadline may not want to bring attention to their lab which could cause delays or raise barriers against them getting their work done. Incident reporting must be cooperative, and not disciplinary in nature. There is also the option to provide anonymous reporting. The focus must be on improving the efforts to manage risk exposure to an acceptable level.

Reporting barriers may also be removed by getting key stakeholders involved in the process. This could be having students or staff be involved in the investigations or act as a liaison for the department. These processes can help build trust and relationships and also improve communication with various groups.

Responding to Build Trust is about taking the time to reach out to any concerns that are submitted. This includes investigating the incidents and sharing the relevant findings with the community members who are most affected (Rommel, 2022). The amount of investment in the incident should be relative to the risk-posed, but it may be beneficial to have regular communication with staff and students who submit incident reports. The learnings can be shared through a variety of methods, including department/institutional communications, staff meetings, safety meetings, hazard bulletins, lessons learned, or learning experience reports. The title and method of communication should be decided based on what will work best for the institution.

Creating Lasting Change is about ensuring the system provides a wide-range of benefits for the users. The information should be accessible (as appropriate), data should be

reviewed, learnings should be shared, and all users should feel confident in the system. Overtime, with improved near miss reporting, institutions should see a decline in incidents and unsafe conditions and an overall improvement in health and safety.

The second recommendation is to ensure that limited resources are used in an efficient and effective manner, and this includes investigating incidents and implementing corrective actions. Having a system to report and respond to incidents is important, especially to build trust and affect change. However, having reports is not beneficial if no action is taken from an organizational perspective.

As can be seen in the results and discussion of the incident data, there are many trends to be found. And it is not enough to just focus on the high-frequency incidents, because despite them being more common, they may pose a minor risk to staff. For example, paper cuts might be very common, and while they need to be treated (cleaned and bandaged) to ensure they do not become worse, drastic action does not need to be taken to reduce the number of papercuts that occur. It may be an acceptable risk to allow the paper cuts to continue occurring. In contrast, an organization may wish to focus in on the one or two incidents that could have killed or seriously injured someone, as that level of risk is unacceptable.

Risk ranking of near misses to their consequences and likelihood of occurrence can provide knowledge on health and safety hazards in the workplace (EJ, B, & J, 2020). By using a risk matrix to assess the likelihood and consequence of a negative event, assessments can help determine if the risk is acceptable to the organizations (EJ, B, & J, 2020). By assessing all near misses and incidents using a risk ranking matrix, an organization can better understand what is happening and where resources need to be focused.

There are many risk matrices available. Some use a 5x5 table to determine likelihood and consequence. Others use a 3-factor system including likelihood, frequency, and consequence. And some combine two of these factors into a single risk-matrix, such as the one used by this institution, where both likelihood and consequence are factored in

together. The particular tool used is less important, as long as the tool is applicable to the risks that the organization faces.

Once a risk-ranking tool is implemented, additional trends can be seen. These trends may or may not line up with the frequency trends found by just looking at the incident data alone. If the high-frequency events are also high-risk, the organization will know exactly where to focus their efforts. If the high-risk events are not the same as the high-frequency events, an organization needs to determine an acceptable risk tolerance and act on those that fall outside of the determined tolerance.

A third recommendation would be to ensure the proper training of all staff on near miss and incident reporting, and incident investigation/corrective actions where required. The survey identified that 11/36 (30.5%) respondents were unaware of the requirement to report incidents. While this is a very small sample size and not necessarily reflective of the entire institution, or academic laboratories, it is a concerning find that almost one-third of people were not aware they were required to report incidents.

It is well known that communication, education, and training can improve performance, and this is likely no different with incident reporting. A study published in 2009 titled "Reporting Practices in the United States: A 2008 Survey of Biosafety Professionals" (Chamberlain, et al., 2009) looked at the training and incident reporting specific to biosafety laboratories. They found that despite clear instructions to report incidents, there were identified practices in both training and incident-reporting practices that could be improved.

The first identified area for improvement was around determining which individuals require training and instruction on incident reporting (Chamberlain, et al., 2009). They note the complexity of labs as the labs grow in physical size, in number of people, and collaborative efforts increase, determining the adequate training can be a challenge. This complexity is no different than a general academic laboratory in which various individuals may have different responsibilities.

Another area is that adequate training involves using proper training methodologies that result in the greatest absorption and retention of concepts taught (Chamberlain, et al., 2009). Determining the best type of training may be difficult, and the authors note that some activities would require hands-on simulations while others can be described verbally. The best method of training for incident reporting may be something in-between. For example:

- A) All staff could receive instruction and the opportunity to report an incident in the incident reporting portal (perhaps through a test-system, or in a manner which they can easily be separated from actual incident reports).
- B) Supervisors and Management could receive the above training and training that will help them ensure their staff report incidents. Other training should include details on assessing the risk of a near-miss/incident and determining the appropriate corrective actions.

The final recommendation is to ensure appropriate resources are assigned to manage incident reporting, risk-ranking, and training. Near-misses and incidents are an important part of an overall management system. The data available, when combined with other health and safety management system components such as hazard assessments, inspections, and training and competency, can provide valuable insight into the highest risks of a post-secondary institution.

This research does have limitations and further research would be required to determine if this is the case. One limitation of this project was the small sample size and the participants were focused from a single Faculty in the survey responses. Depending on the current state of the incident reporting culture in the Faculty, it may or may not be representative of other faculties or at other post-secondary institutions. Additional research that includes surveying multiple faculties and multiple institutions may provide a better picture of the trends in incident and near miss reporting.

Another bias that needs to be considered is self-selection. The survey was not conducted randomly but was communicated out to request people to participate. All



persons who wished to participate were included. This could lead to individuals responding because they already have an interest in incident reporting, which could mean that these individuals are already reporting incidents as they should be. Conversely people may have not wished to portray their laboratory in a negative light and this may have had an effect on the reported results. We tried to reduce these limitations by ensuring the survey was anonymous and asking questions in a way, so people were more likely to answer honestly. But it was not possible to eliminate this potential bias from this type of survey. Future surveys could be conducted using random selection and anonymous manner to further minimize these biases.

However, despite these biases, it does not mean that positive improvements cannot be made. The first step would be to ensure all researchers in all academic laboratories are reporting incidents and near misses. If all incidents and near misses are reported, several things can happen:

- Institutions can gain a better understanding of the trends of incidents and near misses that are occurring. In a world with ever demanding strain on resources, efforts could be focuses on the areas where they would make the most impact.
- Researchers would be able to do additional research into the types and causes of incidents in academic laboratories. This information could be shared amongst institutions to improve health and safety for all academics.
- In general, reporting of incidents and near misses is an accepted best practice in order to learn from them and prevent future incidents.

## Chapter 5

### Conclusion

The limitations of this study do not allow for the conclusion that near misses and incidents are underreported in academic laboratories, however the evidence suggests that this is potentially the case. The survey data indicates that there is a potential that near misses and incidents are perceived to be under reported in laboratories. The incident data, when compared to accident theory models such as Bird's Pyramid Model, does indicate that there is potential that near misses and incidents are under reported. Further investigation and research are needed to answer this question.

In order to investigate this conclusion further post-secondary institutions would need to encourage incident and near miss reporting as a requirement for all research activities, as per provincial OHS regulations. If a valid set of incident and near miss information was available in a data base, then researchers could look at a variety of questions surrounding the reporting, trends, and causes in academic laboratories. These questions could include

- What are the underlying causes of incidents in academic laboratories?
- What populations are involved in the most incidents (students/staff, experienced/inexperienced?)
- What type of labs are incidents more likely to occur in?
- What are some specific improvements that could be made in all academic laboratories to minimize the risk of incidents occurring?

Health and safety management is always about continual improvement. Formal studies are not needed to take action and improve safety for researchers in many disciplines. However, further research would help to identify if there are any areas of focus that would see the most benefit from the changes. Post-secondary institutions cannot rely just on meeting legislative requirements to ensure their staff and students are kept safe. Seeking out and implementing best practices and improving the health and safety

management systems effectiveness are likely the next step in reducing incidents and injuries in the workplace.

In addition, post-secondary institutions are training the next generation of scientists, engineers, artists, lawyers, business professionals, medical professionals, and cultural and socio-economic experts. By taking the lead in health and safety including practices such as understanding the importance of reporting near misses and incidents, post-secondaries can prepare their students for the expectations outside of academia.

Health and safety is an important part of every workplace and the next generation needs to be prepared to meet the newest challenges to ensure every worker makes it home safely.

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## **Appendices**

## **Appendix I**



# Laboratory Incidents and Near Miss Survey

Title of the study: Lab Incidents and Near Miss Reporting

Principal Investigator(s) (Supervisor(s)):

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Invitation to Participate: You are invited to participate in this research study about lab incidents and near misses at a postsecondary institution.

Purpose of the Study: From this research we wish to learn how many incidents and near misses occurring and how often they are reported. It is hypothesized that many near misses and incidents occur in laboratories that are not reported through the official incident reporting portal. By demonstrating this post-secondary institutions may be better equipped to improve incident reporting processes which may help improve overall health and safety in a laboratory.

Participation: If you wish to participate in this study, please complete the attached survey. The survey should take you approximately 5 minutes to complete. You do not have to answer any questions that you do not want to answer. Once you have completed the survey, please choose the submit button at the end of the survey.

Benefits: There are no personal benefits to the study participants as part of this survey.

Risks: A risk of this study is that we are asking for an honest response to the number of incidents and near misses that occur in your lab versus the number that are reported. This may cause a social risk of concern to status/reputation for reporting non-compliant behaviour (incidents/near misses are not being officially reported).

In order to minimize this risk, all survey submissions are anonymous and the study team will have no access to personal information. The responses will not be able to be tied to you or

your individual lab.

**Confidentiality and Anonymity:** The information that you will share will remain strictly confidential and will be used solely for the purposes of this research. The only people who will have access to the research data are the study team. In order to minimize the risk of security breaches and to help ensure your confidentiality we recommend that you use standard safety measures such as signing out of your account, closing your browser and locking your screen or device when you are no longer using them / when you have completed the study. Anonymity is guaranteed since you are not being asked to provide your name or any personal information.

**Data Storage:** Electronic copies of the survey will be encrypted and stored on a password protected computer in the School of Public Health at the University of Alberta.

**Compensation (or Reimbursement):** There is no compensation or reimbursement for participation in this study.

**Voluntary Participation:** You are under no obligation to participate and if you choose to participate, you may refuse to answer questions that you do not want to answer. Should you choose to withdraw midway through the electronic survey simply close the link and no responses will be included. Given the anonymous nature of the survey, once you have submitted your responses it will no longer be possible to withdraw them from the study.

**Contact Information:** If you have any questions or require more information about the study itself, you may contact the researcher at [ghodgson@ualberta.ca](mailto:ghodgson@ualberta.ca)

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have any questions regarding your rights as a research participant or how the research is being conducted you may contact the Research Ethics Office at 780-492-2615.

Please keep this form for your records. You may download and print a copy of this information letter at this link.

<https://drive.google.com/file/d/1BvdMuf17XFyvPMWf4vxZINXu02H7wDyp/view?usp=sharing>

Completion and submission of the survey means you consent to participate.

1. Are you a student, staff member, or faculty member? (Select all that apply)

*Check all that apply.*

- Student
- Staff Member
- Faculty Member

2. Please enter your Faculty

---

3. Please select the type of lab you work in?

*Mark only one oval.*

- Wet Lab (Handling hazardous products such as chemicals, biological products, radioactive products, etc..)
- Dry Lab (Minimal hazardous products and activities such as a computer lab, math lab, or simulation lab)
- Other Lab (Minimal hazardous products but some hazardous activities such as a robotics lab, mechanical shop, etc..)

4. Please select the total number of years you have been with the University or other post-secondary institutions?

*Mark only one oval.*

- 0-4 years
- 5-9 years
- 10-14 years
- 15-19 years
- 20-24 years
- 25+ years

Training in  
Incident  
Management

This section will focus on the level of training you have received in incident management. Please answer each question honestly.

5. Have you received formal training in incident reporting? (Select all that apply)

*Check all that apply.*

- Yes, through Health, Safety and Environment
- Yes, through my supervisor
- Yes, from another institution/program
- No, I have not received any formal training in incident reporting.

6. Prior to this survey, were you aware of the incident reporting portal and when to report incidents?

*Mark only one oval.*

- Yes
- No

### Near Misses

This section will focus on near misses. For the purpose of this section, a near miss is defined when something has happened that was unexpected/unplanned but did not result in any loss (no injury/illness or no property damage).

7. In the past 6 months, how many near misses would you say occurred in your lab?

*Mark only one oval.*

- 0
- 1-2
- 3-5
- 5-9
- 10+

8. In the past 6 months, how many near misses would you say were reported through the University's incident reporting portal?

*Mark only one oval.*

- 0
- 1-2
- 3-5
- 5-9
- 10+

### Incidents

This section will focus on incidents. For the purposes of this section, an incident is defined when something unexpected/unexpected happened that resulted in an injury, illness, or property damage.

9. In the past 6 months, how many incidents would you say occurred in your lab?

*Mark only one oval.*

- 0
- 1-2
- 3-5
- 5-9
- 10+

10. In the past 6 months, how many incidents would you say were reported through the University's incident reporting portal?

*Mark only one oval.*

- 0
- 1-2
- 3-5
- 5-9
- 10+

Submission

Thank you for completing the survey. Please hit submit to finalize your answers.

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## **Appendix II**

Severity	CRITERIA				ACTIONS
	Injury/Illness/Regulatory Impact	Near Miss / PSI	Environmental	Property Damage	
1	No Injury or Health Impact	Extremely Low potential for injury, property damage or environmental impact	Negligible environmental impact - spill or release contained in work area	Less than \$2,500	
2	First Aid Injury	Low potential for injury, property damage or environmental impact	Low environmental impact - spill or release - contained in work area	\$2,501 - \$25,000	
3	Medical Aid, Modified Duty, Lost Time Injury and WCB Reportable	Moderate potential for WCB injury, property damage or environmental impact	Moderate environmental impact - spill or release - impacts adjacent work areas, contained on [REDACTED] property	\$25,001 - \$100,000	
4	Serious Injury (admission to hospital and other serious incidents) and/or Regulatory Reportable Incident	High potential for serious injury, property damage or environmental impact - Report PSI to Regulator	High environmental impact - spill or release off campus - Regulatory Reportable Incident	\$100,001 to \$500,000	
5	Fatality and Regulatory Reportable	Extremely High potential for serious injury or death, property damage or environmental impact - Report PSI to Regulator	Major environmental impact - major spill or release off campus - Regulatory Reportable Incident with high remediation costs and potential for fines	More than \$500,000	



## **Appendix III**

## Incident Information

1.0 \* Incident Description (In as much detail as possible, describe what happened.):

2.0 \* Incident Time:

3.0 Incident Location ():

Location not found in above list:

4.0 \* Incident Type:

Name

5.0 \* Your role in the Incident:

Affected Party:

Affected Party without CCID:

Affected Party Phone Number:

6.0 \* Select the department associated with this incident. (

Department

## Injury/Illness

1.0 \* Was time missed due to the injury or incident?

Yes  No

Time Missed (Indicate how much work or study time was missed due to the injury or illness.)

2.0 \* Indicate which parts of the body were affected:

**Name**

Eyes

Head

Back

Hands

Fingers

Legs

Feet

3.0 \* Was First Aid performed?

Yes  No

### **First Aid**

1.0 Name of person who provided First Aid:

2.0 What qualifications did the person providing First Aid have?

3.0 Describe the First Aid provided:

4.0 Where was further medical attention received?

**Name**

5.0 Is this a work related incident (involves paid workers or volunteers)?

### **Witnesses**

1.0 Witnesses:

<b>Name</b>	<b>Email</b>	<b>Phone Number</b>
-------------	--------------	---------------------

## ***Equipment Involved***

**1.0 Describe the type of equipment and how it was involved.**

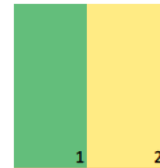
## **Appendix IV**

Description	Reported Incident Type	Actual Incident Type	Hazard(s) Exposed to	Exposure Method	Missed Time	Amount Missed	Injured Parts	First Aid	Further Attention Location	Faculty	Risk Ranking		Year	Subcategory
											of Incident	Risk Ranking Potential		
I was using the polishing machine in the MecE shop to polish a metal aluminum disk. The disk was big, heavy, and wasn't very easy to grip, especially since I had the water running to clear any wear debris. The disk slipped from my hand and fell onto the rotating disk of the polishing machine and the aluminum disk started to rotate with it. Since the aluminum disk was heavy, the weight was unbalanced on the polishing disk which made it wobble intensely. I was worried that the aluminum disk would fly off the machine because of all the vibrations so I immediately shut down the machine to stop the polishing disk from rotating. However, it wasn't slowing down fast enough and I was afraid that the aluminum disk would shoot off, so I put my hands on the aluminum disk to try and stop it while it was rotating. The disk had a sharp edge which unfortunately gave me some cuts on my fingers. A cut on my right thumb, left pinky, and left middle finger. I washed my hands after that and the lab assistant wrapped some gauze/bandages on the cuts.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Fingers	no		Faculty of Engineering	2	3	2022	cut
Today, June 23rd 2022, I was working in the fume hood 244 with a pressure vessel model A2230HC3EB from Parr and a heater reactor. I was making Hydrochar with 30g sugar beet pulp (horse food, dark brown color) and water (300mL) under pressured conditions. As the reactor reached 300 Celsius degrees, I decided to leave the lab and come back to when the reactor reached the desired temperature to initiate the residence time. When I returned to the lab, I noticed the burnt sugar beet pulp smell. There was some liquid at the top of the fume hood, and little white pieces of something which indicated an explosion inside the fume hood. *, the lab coordinator, entered the lab five minutes later than I did. I informed the incident and she kindly helped me to report this case and advise students to avoid using the fume hood until further investigation.	Property Damage	Property Damage								Faculty of Engineering	2	2	2022	
At the date, time, and location listed below, a co-op research assistant sustained a cut along the side of their right leg due to contact with a sharp edge on the side of a piece of machinery. The sharp edge in question was located on the left-hand side of a large maypole braiding machine on the east side of the room, along the surface of a gray box underneath a lever used for dispensing lubricant. Fortunately, the student was wearing appropriate PPE (long pants) which prevented more severe injury. While deep enough to draw blood, the cut only required minor first-aid to be treated.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Legs	yes	Did not receive any further medical attention	Faculty of Engineering	2	3	2022	cut
I was cleaning circuit boards using Branson fluid cleaner. After about 5-10 minutes of relatively strong odour exposure outside of a fume hood and with no mask being worn, I thought to check the MSDS to ensure that I was performing my cleaning appropriately. The MSDS said "IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center or a physician." I immediately left the lab and called the . The center asked if I had felt lightheaded or nauseous in the time since initial exposure, to which I replied no. They said I should be fine and have nothing to worry about because of the lack of symptoms, since they would only expect acute symptoms for exposure to this substance.	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Inhalation					no	Faculty of Engineering	1	3	2022	chemical

There was a spillage of concentrated H2SO4 (98%, ~ 3mL) in lab 5-108 (Department CME) on June 6, 2022 at 10 am. The spillage occurred inside a fume hood and was immediately covered with spill-X acid neutralizer. The site was then inspected by Dr. \*. The neutralized acid was scooped into an acid-resistant plastic container which was then covered. The contaminated site was then washed with plenty of water. pH of the site was 6 after cleaning.

Near Miss or Unsafe Condition    Near Miss or Unsafe Condition

Faculty of Engineering



2022

On May 31, 2022, I was in the workplace (Room No: 7-128) at 11:30 a.m. \*, a post graduate student was working near to me in the biological cabinet to prepare lipopolysaccharide (LPS) stock solution. LPS is normally used for the stimulation of cells. He was doing high concentration stock solution (1 mg/mL). After preparing the stock solution, he disposed the syringe in the disposal box and the syringe accidentally poked his finger (left hand middle finger). Even though he was using double gloves, the syringe poked him. In few seconds, he came to me and informed about the incident. Then, he felt dizziness and immediately we called 911 for the emergency medical service.

Exposure to Hazardous Substance    Injury/Illness (Including sprains and strains)    Chemical    Cut/Laceration/Puncture/Needlestick

no

Faculty of Engineering



needlestick 2022 k

I was disassembling the hoist of our thermal vacuum. (TVAC) chamber which consists of heavy vertical pipes. 1 pipe rests within another and the outer pipe is split into 2 pieces. When attempting to access the inner pipe, I needed to lift one of the outer pieces. I lifted one of the outer pieces but then needed to quickly place it back and in the process pinched a small portion of my left palm. A minor blood blister occurred as a result.

Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)

no

Hands no

Faculty of Engineering



2022 pinch

I accidentally pinched my finger under a metal cylinder that I was holding.

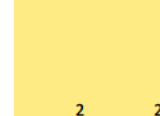
Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)

no

Fingers yes

Did not receive any further medical attention

Faculty of Engineering



2022 pinch

We had a user, (\*) that turned on the blue laser, set it up for cutting then left the room while it was active. \* happened to walk by and stopped the machine after it had been running for 13 minutes before he asked me if I was aware of the situation. We then both proceeded to turn off the laser and it was another 5 minutes before the student returned. When I informed him that it was unacceptable what he had just done, (fire hazard), he commented that it had been cutting fine and he was just quickly going to use the bathroom. I then reminded him that it was now nearly 20 minutes since he had left and asked why he didn't simply pause the machine. He agreed in hindsight that would have been better.

Near Miss or Unsafe Condition    Near Miss or Unsafe Condition

Faculty of Engineering



2022

On March 30, 2022, at about 2.16 pm, a student opened a yellow flammable storage cabinet to obtain nitrobenzene. The nitrobenzene solvent was kept in glass vials secured with tight lids and parafilm, and stored in the yellow flammable cabinet. On opening the cabinet, the student observed a smell. A PDF who had been working in the same lab confirmed that there was a smell from the cabinet. They both described the smell as aromatic. That student and the lab coordinator transferred the glass vials containing nitrobenzene to the fume hood. All students evacuated the lab afterwards. The PI was notified and the lab 5-034 was then closed. On March 31, 2022, at 9.00 am lab coordinator and another PDF went into 5-034. There was no observed smell in the lab space or from the yellow flammable storage cabinet. Glass vials and storage containers in the cabinet and the fume hood were checked for chemical spills, leakages, or broken seals but none was observed. Old samples and solutions including nitrobenzene were either discarded or transferred to new glass vials tightly sealed and labelled. All waste were discarded through Chematix.

Sharps container left on dock. \* : 7120

More hazardous chemicals left on dock. \* (1 6-120).

I was attempting to open (unthread) the 1" pressure transducer from the pipe manifold and hurt my back. It was very tight to open and I must have exerted more force than I should have in opening and that might have pulled out muscle in my back.

Multiple hazardous chemicals left on dock for Waste Pick-up by HSE. Includes: bromine (Toxic by Inhalation), ammonium hydroxide, multiple acidic solutions containing mercury compounds, flammable liquids, unmarked containers.

I used oven #1 for drying S2/Toluene mixture (total volume = 600 ml). The samples were placed into two aluminum containers, and placed inside the oven on Thursday noon. Pressure 20, Temperature 50C. I checked the samples on Friday, and everything seemed fine. There is a small pressure drop, and the samples looked a bit wet. Thus, I decided to leave the samples in the oven over the weekend. On Sunday, \* sent me a WhatsApp message that showed the gasket of the oven was dissolved and broken. On Monday morning, \* and I checked the oven again. Inside the oven was foggy. To check the oven, I released the pressure and Toluene was leaking out of the oven. I used tissues to dry Toluene as soon as possible. The brown tissues was dispose safely in a bag inside a fume hood. I put notes on both sides of the doors to ensure no students enter the lab. There was not any human harm, as I was wearing two masks plus gloves.

Other Exposure to  
Near Miss or Hazardous  
Unsafe Near Miss or  
Condition Unsafe  
Near Miss or  
Unsafe  
Condition

Injury/Illness Injury/Illness  
(Including (Including  
sprains and sprains and  
strains) strains)

Near Miss or Near Miss or  
Unsafe Unsafe  
Condition Condition

Property  
Damage  
Exposure to  
Hazardous Property  
Substance Damage Chemical Inhalation

no Back no

Faculty of Engineering	1	1	2022 chemical
Faculty of Engineering	1	1	2022
Faculty of Engineering	1	2	2022
Faculty of Engineering	1	1	2022 strain
Faculty of Engineering	1	3	2022
Faculty of Engineering	1	2	2022



A short safety meeting was held before the start of the work to ensure all three parties were aware of all chemicals being handled, the task at hand, the process, the location of spill kit, eyewash station, shower, and each individual responsibility. All personnel were wearing required PPE (Gloves, goggles, and lab coat) to perform the task. A 5-gallon container (pail) containing oil and gas tailing slurry was the last container to be labeled and dispose of. Failure (spill) occurred when \* (Part-Time lab assistant) lifted the container. The reason for failure and the spill was quickly identified. The bottom section of the metal container corroded and separated the bottom section from the rest of the container

Other Environmental Release

Faculty of Engineering



2022

This form is being filled by Research Associate Dr. \*and PI Dr. \* on behalf of PhD student \*, who was injured while working in the lab. Additional details may need to be obtained from the student later. This is the text from the student's email received on December 9, 2021, Thursday at 9:54 pm: "I went to the lab today to thaw a vial of H9C2 cells and start my experiments. I have thawed a frozen vial many times before and that was not new to me but incidents still can happen even though you are doing it for 100 times. As you know we put the vials into the paper [cardboard] box and put the box in the metal rack. The paper box lid was stuck and I struggled to open the box. During struggle to open it, my fingers were in contact with cold box for rather long period and I started to feel numb in my fingers. Finally, I opened it and did everything but when back home, I realized all my fingers are swollen and red. They are completely burnt. Big blisters are on them and they are useless now. I even can't type and I got help from [my husband] \* to type this message. I remember that during training courses they were saying that whatever happens in the lab we should report that. I do not know if it is enough that I report it to you or I still may need to report it to the university as well? At the moment, I can not touch anything and can't do anything. I do not know how it is going to be in the next few days but if it doesn't get healed, I may not be able to do my experiments."

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

yes Unknown Fingers yes

University Health Centre Faculty of Engineering



2021 burn

Cord reel plugged into receptacle T22N-20 was pulled down to use, clamp on cord sheath failed due to strong spring on reel and pulled the electrical connections out of the plug receptacle. Open wire ends were arcing as the cord re-wound into the reel. \* turned off the outlet at the breaker, then the reel was unplugged from receptacle T22N-20, and breaker was turned back on. It should be noted, this cord reel was shortened by F&O Sept. 2019 to prevent the reels from reaching water supplies. Shortened reels caused the winding spring to become tensioned more.

Property Damage Near Miss or Unsafe Condition Property Damage

Faculty of Engineering



2021

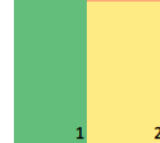
Yesterday (Dec. 1, 2021), I made a sample that included Polystyrene in 2ml of chloroform and 10% Polyvinyl alcohol. The chloroform was supposed to evaporate after a specific time under a fume hood. So, after my experiment was finished, I took the resultant on a table and transferred it to storage vials. However, I understood that chloroform did not evaporate, so I was exposed to chloroform.

Exposure to Hazardous Substance Exposure to Hazardous Substance

Chemical Inhalation

no

Faculty of Engineering



2021 chemical

A spill occurred on the weekend of Nov.6 and 7. CSIP bath was circulating fluid with with the "Fill" valve in the open position. Upon return on Nov. 8, \* reported ~2L of fluid had leaked from the Fill plug, and was caught by secondary spill containment. Small NaOH deposits were seen on floor from splashes. Tank was drained, fluid marked for pickup, tank removed from pallet, pallet was cleaned and fluid collected was neutralized with vinegar. Tank was replaced and refilled, with a pH of 12 and density of 1.025 SG.

Environmental Release Environmental Release

Faculty of Engineering



2021

During a CBC news interview in 5-034 lab, a reporter fainted and collapsed to the floor. She was awake and responsive afterwards, but we were not sure if she had hit her head on the way down. Paramedics arrived within about 15 - 20 minutes, and they tended to the reporter on site before taking her to the hospital as a precautionary measure. The incident was related to a personal/medical issue with the reporter. No environmental hazards were present, and no experiments were underway at the time of the incident.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no

Head Back yes

Emergency Department Hospital Admission

Faculty of Engineering

3

3

2021 medical

A tiny metal piece got in my left eye because I didn't wear safety glasses while grinding a sample.

Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains)

2

4

2021 eye

Accidental contact with heating plate. Minor burns on thumb, index, and ring finger of left hand.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no

Fingers yes

Did not receive any further medical attention

Faculty of Engineering

2

3

2021 burn

We put a parcel on the cart outside the machine shop to transfer the parcel to my lab in I. When I was helping my student to move the parcel, we needed to partially lift the cart. Unfortunately the handle of the cart came out when I partially lifted the cart and the whole cart came on top of my feet. I have had severe pain since yesterday in my toe and have pain and difficulty walking. I needed to go to the UAlberta health clinic and did x-ray on Sep 29. I don't know the x-ray result yet.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no

Feet no

Faculty of Engineering

3

3

2021 drop

I was working in the chemistry labs in E1-44 on my first lab of the semester. It is my first time being in the lab as last year I was unable to attend in person classes due to COVID. At about 16:50 when the lab was finished, I went to put away my hot plate with the rest of my equipment. My hot plate was unplugged and cooling down for about ten minutes. I went to grab the hot plate from the side and felt extreme heat and pain and went immediately to rinse my fingers under cold water. I got another classmate to get the TA to let the know what happened. The TA then went to go get the lab coordinator and I kept running my fingers under cold water until the lab coordinator arrived. The lab coordinator came around 17 00 to apply first aid to the burns on my hand.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

yes

Less than 3 days

Fingers yes

Did not receive any further medical attention

Faculty of Engineering

3

3

2021 burn

The disinfectant smell coming out from the sewer. It soon fullfill the whole room space.

Environment al Release Exposure to Hazardous Substance

Faculty of Engineering

1

1

2021 chemical

A smokey smell was detected by my colleague. After further inspection, we noticed the box furnace was producing fumes. I went to quickly go turn it off, after that, the fumes got vigorous at that point I asked my colleague to locate the nearest fire extinguisher. I suspected a fire was happening inside possibly. I opened the furnace door slightly, the small fire was showing, at this point my colleague located the fire extinguisher but the fire was growing. I grabbed my heat gloves to hold the door open while my colleague used the fire extinguisher to put out the fire. After that we were contacting our supervisor and inspecting the damage. My colleague called the facility coordinator to let them know about the used fire extinguisher and I called EHS. Only my sample were damaged and the box furnace slightly. Everything else and everyone was safe.

Near Miss or Unsafe Condition Property Damage

Faculty of Engineering

2

3

2021

Hurt on finger by glass shards in lab	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Engineering	2	2	2021	cut
The incident happened while in the laboratory while trying to reposition a test pipe in a chuck. Unfortunately the pipe slides a bit and as a reflex movement I tried to catch it, completely neglecting that is a heavy item. I did get it but the wrist of my hand hurt. The pipe is not huge as is intended for two people to be carried ( my coworker was helping as we also have non work alone policy), the issue was the reflex of me trying to get it and my wrist not being able to handle the weight. At the end of the day the wrist was a bit painful but not swollen, During approximately a week I thought that only with ointment the pain will disappear and I will recover until the pain became unbearable and the range of movement on my thumb decreased. This is the moment I went to the doctor.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Hands	no		Faculty of Engineering	3	3	2021	strain
I and my co-worker were working in the lab in 5-110 I F when we suddenly smelled the gasoline-like smell coming from the sewer. I thought someone may pour the volatile fluid into the sewer. I immediately called the on-site person. The on-site person came and visited the lab next door and the on-site person said the smell might come from the lab next door. The technician applied some water to the sewer of the lab and the smell was reduced. Until the time we left, the smell had gone.	Other	Exposure to Hazardous Substance					Faculty of Engineering	1	1	2021	chemical
A PID temperature control system was being wired up by the coop student. This included working with high voltages from power a outlet (120V). During construction of this circuit, which was being done by the student, there was a miscommunication about the heating component - the supervisor thought that a high wattage heating tape was being used, whole the student intended to use a low wattage heating cartridge. When the low wattage heater cartridge was connected to the system, it recieved far more than it's 24 V rating, and instantly blew out, producing a loud bang from where it was hanging on the floor. The system was correctly setup for a high wattage heating tape, but not for the small heater cartridge. A scorch mark was left on the floor and the cartridge was destroyed, but no injuries were sustained by the student because of their distance from the part. Some sparks were given off but, but no shrapnel	Near Miss or Unsafe Condition	Property Damage					Faculty of Engineering	1	1	2020	
While attempting to mix and subsample a large barrel (50 gallons) of Mature Fine Tailings, it was discovered that the bottom of the barrel was rusted and a hole appeared during the sampling process. This hole opened up at the bottom of the barrel and began to spill Mature Fine Tailings onto the floor. Approximated 5 gallons of Mature Fine Tailings from Oil Sands operations was spilled, but contained. Subsampling was successful, however there was quite a large mess to clean. We used universal spill absorbent, micro 90 cleaning solution and spray degreaser to clean up the mess. All used paper towels and used spill absorbent have been disposed of correctly.	Near Miss or Unsafe Condition	Exposure to Hazardous Substance		Environmental Release	Chemical Other	Absorption/Skin Contact	Faculty of Engineering	2	2	2020	

While using the spray booth, the submerged pump float got caught and did not activate the pump. The bucket that holds the pump overflowed before \* noticed the pump was not activating. Once aware of the spill the float was manually freed and the pump started draining the water. However, the hose from the pump to the building drain popped out of the inlet to the building drain and more water spilled before that was repositioned. Spill was contained and mopped up. Water did reach the West wall and joint between the wall and floor. Rags were used to absorb any water in the joint.

Other Property Damage

On 16 September 2020 I found a biosafety cabinet in room 4-128 C that had been moved from 5-002 N. The cabinet had not been decontaminated before it was moved. I spoke to Dr. \* on September 28 and he was not aware of the protocol for moving cabinets. The cabinet passed inspection on September 16.

Near Miss or Unsafe Condition Near Miss or Unsafe Condition

Evening of 8th of August -80C freezer in 6-034 failed and went up to -3C. This resulted in an alarm to be triggered. No potential release or contamination to any chemicals or bacteria that was stored in the freezer took place. Everything was in their self isolated containers. Sunday morning my student went into the lab (as I was away in holidays) with me and Dr. \* and Dr. \*h on Video call, and transferred the materials from -80C freezer to a -20C freezer in the lab. We have contacted Dr. \* group to help us dispose of the bacteria in the lab as Dr. \* - who is the trained person to autoclave these using the Autoclave in our lab - has left the group recently.

Other Property Damage Near Miss or Unsafe Condition Exposure to Hazardous Substance

A hose clamp failed on an argon line to an mBraun Unilab Glovebox. This allowed the hose to dislodge from the hose barb and released an entire T cylinder of argon gas into the laboratory.

Near Miss or Unsafe Condition Exposure to Hazardous Substance

Brief ammonia release from Trion PECVD equipment in r 3 cleanroom at 13:45. All present evacuated safely; no casualties. Ammonia level down to 0 ppm within 20 min. All-clear given by building warden at 14:05. RCMS was unaware of toxic gas alarm due to erroneous silencing of I AS alarm.

Near Miss or Unsafe Condition Exposure to Hazardous Substance Chemical

no

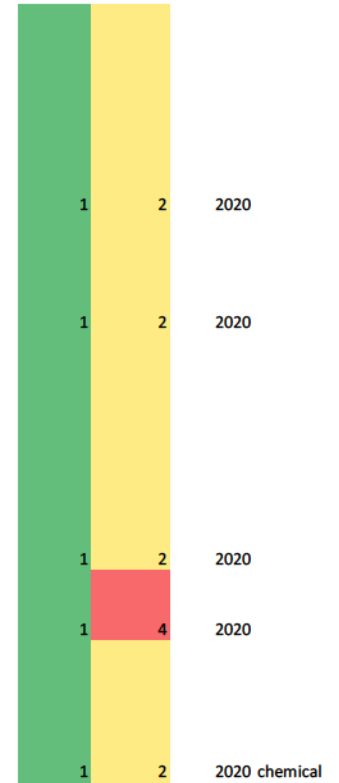
Faculty of Engineering

Faculty of Engineering

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Faculty of Engineering



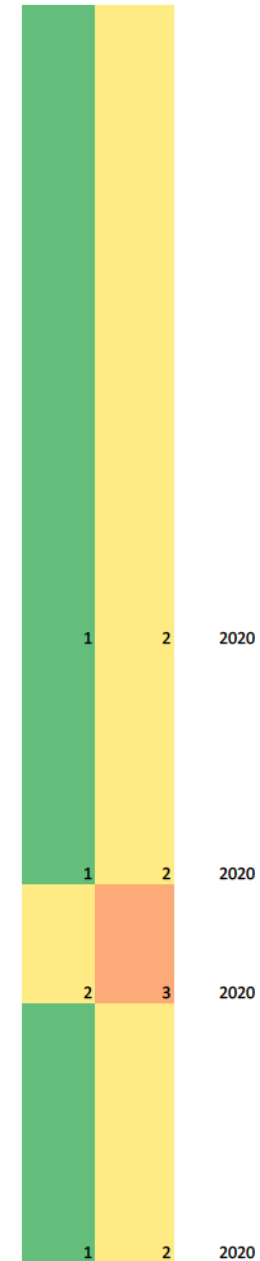
inspected the table top for screws, bolts and other metal. They noted there were plugs in the side of the table (across the 31in width) and assumed the table was reinforced with wooden dowels. Proper saw technique was used, with \* pushing the table through the blade and \* assisting from the side to keep the table against the fence. The blade was raised to its maximum height (2in) to cut in multiple passes, and a riving knife was used to mitigate any kickback. The assumption of wooden dowel reinforcement was wrong: 8in into the cut, the SawStop was engaged as the blade contacted one of the 4 metal rods that reinforced the table across the 31in width. No injuries were noted to anyone involved. \*'s Statement: "On tuesday June 30, 2020 at 12:00 \* and I set up the table saw to rip a 3 5 in. thick wood table top in half. The table top was 31 in. wide and 67 in. long with 4 wood dowels inlaid along the length of the table. We assumed that these dowels extended through the width of the table. The table had other screw and bolt holes inspected for broken fasteners. A metal detector was not used to determine if there was any metal in the table. The saw was set up with a blade specifically designed for ripping wood and a riving knife. The blade height was set at 2 in. to cut through the table top in multiple passes. Due to the mass of the table, \* and I worked as a team to cut the table. We carried it over to the saw. [REDACTED] stood behind the table to push it through the saw. I stood on the left side of the table to push the table against the saw fence and ensure the table was resting flat on the saw table. Nobody's hands would get within 6 in. of the blade throughout the cut. About 8 in. into the cut we heard a thump that sounded like the SawStop engaging to stop and retract the saw blade. I turned off the saw and we moved the table top to see the saw blade had dropped. After, we flipped the table over to inspect the cut. Threaded metal rod Property was visible with a flashlight and it was roughly aligned with the dowels on the Damage sides of the table." \*'s Statement: " At around 12:30pm Tuesday the 30th, \* and Other

~ 50 mL nitric acid solution (50%nitric in H2O, used to remove trace metals) was accidentally poured into a organic waste container ~ 200-300 mL containing ethanol, hexane, acetone, benzyl ether). White color vapor was produced right after mixing nitric acid with organic solvent. it stopped producing more vapor after 5 mins. The mixture became warm like body temperature. I watched the bottle for one hour. There is no more vapor produced.The bottle is now in fumehood, with no cap on. It is also inside a secondary container, no cap. I labeled bottle and fumehood. Please help me with waste disposal. A researcher was operating the centrifuge when they realized that they did not secure the lid onto the rotor. Without the lid secured, there is nothing to anchor the spinning rotor to the driver which can allow the rotor to lift from the pedestal. No injuries were reported, however the damage to the equipment appears extensive.

At approx. 8:45am, \* ( [REDACTED] Employee) informed me of a leak from our CleanStation SRS CS2-PH tank. Upon immediate inspection, there was sodium hydroxide residue on lower section of the wall behind the tank, and the blank plug in the "Supply" port on the back of the tank was dripping slowly (1 drip / 15sec). The tank was missing ~ 3-3.5" of its water level (approx. 13-16L). The bulk of solution volume missing from the tank was contained in the spill containment pallet underneath the tank. Pictures of the spill were taken before the anything was touched. \* and myself donned PPE. The cleaning tank was drained into containment buckets to prevent more leakage, and \* was contacted.

Property Damage Other  
Near Miss or Unsafe Condition  
Near Miss or Unsafe Condition  
Property Damage  
Near Miss or Unsafe Condition  
Property Damage  
Environment al Release Environment al Release

Faculty of Engineering  
Faculty of Engineering  
Faculty of Engineering  
Faculty of Engineering

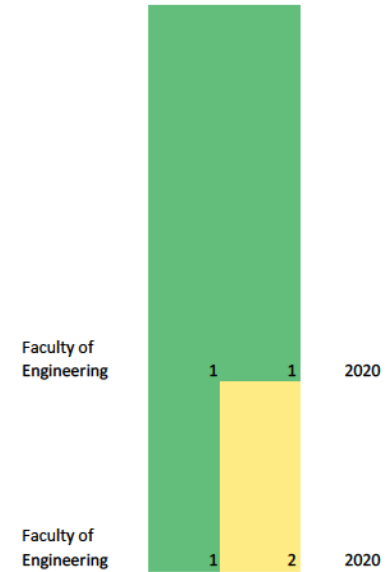


Per the Affected Party statement: "At approximately 10:00 AM, I was setting up our embroidery machine station. I plugged a relocatable power tap into a wall outlet (wall outlet T22M CCT 30, E2-010, ETL). The "RESET" light illuminated when plugged in, indicating the device was powered. I then went to plug in the dual-prong power cord for the embroidery machine, but as I was inserting the plug into the power tap, I heard a loud pop, saw an electrical spark, and saw a small amount of smoke rise out of the power tap outlet. The RESET light turned off and the surge protector switch would not reset. I unplugged the power tap from the wall outlet, and then unplugged the dual-prong power cord. I disassembled the power tap to inspect its internals. There was evidence of a direct fault between the neutral and hot terminals on the power tap outlet into which I plugged the two prong cable. See the attached photo." Pronghorn 8 Outlet power block was damaged, as it shorted internally. The embroidery machine sustained no apparent damages.

Other Property Damage

On Saturday, April 11 there was a small fire in one of our labs. The student (\*) was carrying using only a tweezer a hot alumina crucible for TGA (70 microliters). She let the crucible fall inside the garbage can where there were papers and possibly some bitumen residue. The garbage caught on fire. Her lab buddy came to help her and put down the fire using the fire extinguisher. They cleaned everything up and they let me know about it. Nobody got injured. there was no property or lab damage.

Other Property Damage



Description	Reported Incident Type	Actual Incident Type	Hazard(s) Exposed to	Exposure Method	Misused Amount	Injured Parts	First Aid	Further Attention Location	Faculty	Risk Ranking of Incident	Risk Ranking Potential	Year	SubCategory
Dr. *'s lab injected mice with LPS in LB51 with out having the correct paperwork or training in place. Looks like mice were injected with LPS on either July 3, 4, 5. Cages were not labelled so animal care staff were not aware that they should be extra steps in place.	Exposure to Hazardous Substance Injury/Illness (Including sprains and strains)	Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains)	Biological				no	Did not receive any further medical attention	Faculty of Medicine & Dentistry	1	1	2022	
Bit by a rat during cage change	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)		no		Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2022	bite
Got bit by a rat during a cage change	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)		no		Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2022	bite
Tabletop centrifuge cover fell on the right hand fifth digit. Fifth digit swollen after the incident and become bluish at the site of contact. with the movement of hand there is a pain the the fifth digit.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)		no		Fingers	no		Faculty of Medicine & Dentistry	1	2	2022	pinch
<p>All lab spaces in clinical sciences building were divided up amongst the MLS faculty/staff for inspection with a focus on chemical roundup and disposal. B 121 is a storage room that was missed in that inspection. On May 24, 2022 I was emailed some photographs of some chemical waste found in B 121 (from a MLS faculty member). B 121 has an old hearing testing booth (sealed space) and within that space along with cardboard boxes and stacks of paper in close proximity we found a significant amount of improperly labelled chemical waste. There is not proper signage on the door to signify chemicals present in the room and to be clear this space houses -70 freezers and lab equipment. Finding chemical here was a shock. I reached out to * by telephone as he was our assigned EHS contact during the safety stand down. On Friday May 27 I forwarded the photos to *. On Friday June 10 * and * inspected B 121 and many other teaching and research lab spaces in the basement. The date and time of the incident is captured as the date * emailed me requesting an incident be filed. Email from *: "Hello *, This email is to confirm the site visit that occurred this morning with * (HSE Advisor) and myself to follow up on items of concern that were raised in your Safety Stand Down. Thank you for the diligence and thoroughness that has been displayed by your group in going through all of the spaces in your area to identify any issues. We went through several teaching and research spaces today, and this is a summary of what we saw, and possible next steps. The most concerning issue from a health and safety standpoint is the discovery of several totes of chemical waste in B-121. The room signage only indicates the presence of Biological Material, no chemicals are listed. The chemical waste consisted of the following: Ethidium Bromide (EtBr) liquid waste Phenol-Nitroferriyanide HCl / Ferrocyanide Waste Organic waste Nitrate Reagent A Nitrate Reagent B Biuret Alkaline Waste Some of these</p>	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition							Faculty of Medicine & Dentistry	1	4	2022	

While setting up the necropsy area in room the [redacted] facility [redacted] basement MB82; ~10:00am Friday June 3, 2022), I was bringing down from a shelf above me, a plastic jar filled with formalin and rat liver samples (given tumor and irinotecan+ 5-fluorouracil). The jar looked to have the lid screwed on. The lid was not closed and the jar fell on the counter. Formalin splashed on my clothing as well as in my eyes and mouth. I immediately tried to wash my eyes in the sink. I inhaled formalin fumes during this time. After about 5 minutes, I showered and changed my clothes. [redacted] staff was present thereafter and we looked for an eye wash station. There were none present in the [redacted] facility. The staff managed to find a 118 ml. bottle of "Eye Stream" solution which they helped me use to rinse out my eyes for a few minutes. I proceeded to the laboratory [redacted] 4021) and rinsed my eyes at the eye wash station for a few minutes. I changed my clothes and proceeded to the [redacted] Hospital Emergency room at ~10:50am. I also spoke to Poison Control [redacted] at 11:45am.

Ingesti  
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Conta  
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eye/n  
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outh

When I arrived at the University around 9 am there was a very strong exhaust smell throughout the building. I called maintenance and when they responded to me they said that there is a backup generator running until 11 am. I was told that there would be exhaust fumes coming into the building until it was shut off and there was nothing they could do. So I decided to stop my lab work and leave the lab.

I was practicing ear notching on mice when during restraint and notching (which the fingers are close to the head due to notching) a mouse was able to nip me in a small spot on the skin of my left pointer finger around the knuckle area. It did break skin and bled slightly (not much due to the bite size). My hands were washed with soap and water. The mouse involved was naive.

Student spilled a small volume (< 20 ml) of a culture supernatant containing Trizol. Presence of Trizol in the supernatant would have inactivated any microbes in the supernatant so this is a chemical spill not a biological spill.

Pile of autoclaved lab waste was found on the north side of the Brain and Aging Research Building. The contents were removed from the dumpster and opened under the tree directly behind it.

I was in HB65G changing rat cages when one rat jumped out of the cage and onto the change station. I went to pick the rat up to put him back into the cage when the rat turned its head and bit my right hand in the soft part between my thumb and my pointer finger. My supervisor \* let me know that these rats are considered naive. The bite was immediately washed with soap and water and a band-aid was applied due to the bite bleeding.

Exposure to  
Hazardous Substance

Exposure to  
Hazardous Substance

Chemi  
cal  
Inhala  
tion

no

Faculty of Medicine  
& Dentistry

1

3

2022 eye

Other

Exposure to  
Hazardous Substance

Faculty of Medicine  
& Dentistry

1

1

2022 chemical

Injury/Illness  
(Including sprains and  
sprains)

Injury/Illness  
(Including sprains and  
sprains)

no

Fingers

no

Faculty of Medicine  
& Dentistry

2

2

2022 bite

Other  
Other  
Environmental  
Release

Near Miss or Unsafe  
Condition

Faculty of Medicine  
& Dentistry

1

1

2022

Near Miss or Unsafe  
Condition

Near Miss or Unsafe  
Condition

Faculty of Medicine  
& Dentistry

1

1

2022

Injury/Illness  
(Including sprains and  
sprains)

Injury/Illness  
(Including sprains and  
sprains)

no

Hands

Did not receive any  
further medical  
attention

Faculty of Medicine  
& Dentistry

2

2

2022 bite



A 1L glass bottle containing 300mL of crystal violet stain was dropped and broke inside of our virus culture room. The stain contains formaldehyde and methanol. The bottle was dropped after I had sprayed it with 70% ethanol to bring it into a biosafety cabinet. It slipped out of my hand as I was bringing it into our BSC. I called the research associate \*, who was on his way to the university. I attempted to contain the spill using Wypall pads. When \* arrived, we collected the broken glass into a broken glass container and gathered the Wypall pads into a waste bag. The stain splattered across my pants, boots, and lab coat, so I removed all the soiled articles and placed them into the fume hood and put on scrubs and a spare pair of shoes. We used water to try and get as much of the formaldehyde off the floor. We also spot cleaned where the splatter had spread or where the crystal violet had gotten onto the bottom of shoes and left stains on the floor. All of the formaldehyde waste was placed into our fume hood, including the broken glass. There was some crystal violet on my fingers, likely from handling the gloves, though there was no burning sensation on my hands or on my legs, which were covered by the pants. During the cleanup, there were fumes that I inhaled that caused some irritation that quickly faded after the spill was cleaned. There was no injury from broken glass. The pants and boots were irreversibly soiled and the floor of the virus culture room is stained though there is no residual formaldehyde.

I was handling a male rat for a rat cage change in room HB65G in [redacted]. The rat was relaxed upon touching lightly but was very vocal and reached for my left ring finger when I used a two handed hold to pick the rat up. there is one very small wound on my finger, the other teeth hit my nail so it did not cause injury to my nail.

I was trying to coverslip a slide and noticed two coverslips that were stuck together. I tried to separate the coverslips by gently bending them apart. The coverslip snapped and broke into small shards. One of the shards cut my finger (index finger of my left hand). I immediately took off my glove and applied pressure with a paper towel. I notified my clinical instructor, and washed my finger with soap and water. After about a minute I then applied a band aid.

On April 06, 2022 \* and \* walked into 9-10 [redacted] to test a biosafety cabinet. The laboratory was unoccupied. Dr. \* had left the University last year. We noticed a decontamination sign on the chemical fume hood. According to the sign, \* from C [redacted] decontaminated the fume hood with paraformaldehyde on 24 June, 2021. I spoke with \* later that day and he said that he burned off approximately 20 - 30 grams of paraformaldehyde in an electric frying pan with some steam.

Discovery of \* lab staff using 4% paraformaldehyde in biological safety cabinet. Intracardiac injection. Past procedures. Cabinet vents into the room. Not sure the last time this was done by the lab staff. Lab will halt all procedures using paraformaldehyde until appropriate space is found.

Cut my glove while doing a perfusion. I was taking a mouse brain out and I cut myself with a bones that touch mouse blood and paraformaldehyde 4%

I was cleaning the pig pen in HB29C and I backed into the auto water spout, and I broke the skin.

Incident Description	Category	Subcategory	Chemical	Inhalation	Absorption/Skin	Cal	Cont	Faculty	Year	Chemical
Property Damage Exposure to Hazardous Substance Near Miss or Unsafe Condition	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Inhalation	Absorption/Skin	Cal	Cont	Faculty of Medicine & Dentistry	2022	chemical
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	no	no	no	Faculty of Medicine & Dentistry	2022	bite
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	no	Faculty of Medicine & Dentistry	2022	cut
Environmental Release Near Miss or Unsafe Condition	Environmental Release	Near Miss or Unsafe Condition	no	no	no	no	no	Faculty of Medicine & Dentistry	2022	chemical
Exposure to Hazardous Substance	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Inhalation	Absorption/Skin	Cal	Cont	Faculty of Medicine & Dentistry	2022	chemical
Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	Biological	Inhalation	Absorption/Skin	Cal	Cont	Faculty of Medicine & Dentistry	2022	cut
Other	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	no	no	no	no	Faculty of Medicine & Dentistry	2022	cut

Chemical hazard tags were removed from cages in LB45 by Dr. * before the complete cage change had happened as stated in the SOP.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition						Faculty of Medicine & Dentistry	1	1	2022
I was trying to put a fresh blade on a scalpel handle. The blade has a small notch in it for the scalpel handle, allowing the handle to clip right into the blade notch. The blade was left in the packaging as much as possible for safety. I may have pushed too hard to clip it together and wound up pushing the blade out of the packaging into my finger. It was a relatively deep cut (0.3 cm?) but it was bleeding a lot. I ungloved my hand and grabbed a fresh kleenex and pressed it to the wound for a few minutes. Then a colleague helped put a bandaid on and stopped the bleeding.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	no			Faculty of Medicine & Dentistry	2	3	2022 cut
Using a cart we used to transport swine the back of the cart jammed into *s ankle and made a deep cut that requires stitches. This occurred in a storage room basement of [redacted] located in [redacted]	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Unknown	Other	yes	Emergency Department	Faculty of Medicine & Dentistry	3	3	2022 cut
Informed by student (*) that some formalin splashed in her eye at some point during clean up. No witnesses Eye flushed with eye flush bottle for several minutes	Exposure to Hazardous Substance	Exposure to Hazardous Substance				yes		Faculty of Medicine & Dentistry	1	3	2022 eye
A few 5 mL syringes with needles attached were sticking out of the sharps bin, and when discarding more syringes my middle finger was poked with the used needle and it broke the skin. The needle that poked my finger was used for a peritoneal lavage and contained PBS but was used to draw back peritoneal fluid from mice that were previously injected with 4mg/kg of Doxorubicin.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)				yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2022 needlestick
Glass bottle of xylene (~3L) was dropped and broken. Chemical was cleaned up using absorbable materials and the area cleaned with soapy water several times. Odor linger	Property Damage Exposure to Hazardous Substance	Exposure to Hazardous Substance				no		Faculty of Medicine & Dentistry	1	2	2022 chemical
I was doing routine cage changes for the rats in room MB33. The male rat was handled but was able to reach handler's finger and bite down on it. The male rat was able to draw blood.	Other	Injury/Illness (Including sprains and strains)						Faculty of Medicine & Dentistry	2	2	2022 bite
* was in the BSL2 tissue culture hood and using a needle to resuspend reovirus T1L. This virus is not harmful to healthy humans but BSL2 because it can cause illness in neonatal or immunocompromised mice. * accidentally poked the tip of his middle finger.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)				yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2022 needlestick
During chemical check for the chemical round-up, discovered reported chemical (di-iso-propyl ether, 2L) in serious condition (very old, signs of crystallization on the bottom of the bottle). Also, found additional items in the lab: 4 L diethyl ether (rusted through, expired in 1998), 4L diethyl ether (glass, expired 2004), 1L diethyl ether (glass, expired 2009), 10g 2,4-dinitrophenol (old and dry). Marked cabinets. Next day the lab was shut down by CESO order.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition						Faculty of Medicine & Dentistry	1	5	2022
Minor needle stick injury to finger after drawing blood from mouse. Needle contained mouse blood, but no depression of syringe / injection occurred. Mouse was of good health status, non-infectious. Minor bleeding occurred.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes		Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2022 needlestick

I was in room LB41 finishing my workload at the end of the day when my gown got caught on the door handle. As I was untangling my gown with my left hand, I had my right hand holding the door. When I untangled my gown the door quickly closed and three of my fingers got caught between the door and door frame. It was really painful and I almost passed out. I went over to the sink and ran my fingers under cold water. I left the room and went to the supervisor's office to sign out but she wasn't in the office so I couldn't report the incident. I was in pain and didn't want to look for a supervisor. I just wanted to get home and attend to my injury. I thought that it was not a big deal and that I would be fine but the next day I wasn't able to go to work because my fingers were sore. On Wednesday morning my fingers felt better and I came to work, so I didn't think I needed to report anything.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

yes Less than 3 days Fingers no

Faculty of Medicine & Dentistry



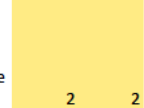
2022 pinch

During a simulation lab today while working on pig jaws, I poked myself with a dental elevator. At the time I didn't notice my thumb was bleeding but when I de-gloved I noticed a bleeding wound. I washed the wound with soap and water and applied hand sanitizer over it, and then a bandaid.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no Fingers no

Faculty of Medicine & Dentistry



2022 cut

On Sunday, Feb 6th, around 10:30 am I was harvesting rotifers from culture B. With my right hand I was scooping the water, which has rotifers and algae, to be poured into a sieve that was being held with my left hand. During this process some of the water splash onto my right forearm. My skin immediately turned red, felt itchy and quickly formed small hives. Once I set down my equipment safely, I threw away my nitrile gloves and proceeded to wash my hands and forearm. The allergic reaction quickly subsided after being washed. A few minutes after the contact reaction I became aware that my nose was stuffy and that I had sneezed a couple times. This may or may not be related as I also have rodent allergies, which is ubiquitous to my work environment.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no Other no

Faculty of Medicine & Dentistry



2022 allergy

Mouse carcasses were autoclaved instead of incinerated (if you need more detail you must allow more than 255 characters in this field)

Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains)

no

Faculty of Medicine & Dentistry



2022

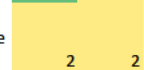
cut right index finger

Injury/Illness (Including sprains and strains)

no Fingers yes

Did not receive any further medical attention

Faculty of Medicine & Dentistry



2022 cut

While collecting dishes from the lab washer on the 5th floor of the building a small amount of "water" splashed into my left eye. My eye immediately became irritated and obviously bloodshot. I immediately flushed the eye using an eye flush station for several minutes multiple times. The eye was still irritated and red after flushing. The irritation subsided after several hours.

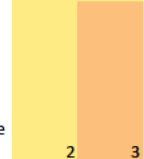
Exposure to Hazardous Substance Injury/Illness (Including sprains and strains) Exposure to Hazardous Substance Chemical

Contact with eye/nose/mouth no

Eyes yes

Did not receive any further medical attention

Faculty of Medicine & Dentistry

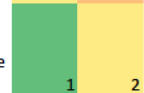


2022 eye

There was a broken mercury bulb on one of our arc lamps. No mercury escaped, just broken glass housing. I called in \* to have a look. He confirmed that it was just broken housing and we should dispose through chematix as mercury waste

Other Near Miss or Unsafe Condition Near Miss or Unsafe Condition

Faculty of Medicine & Dentistry



2022

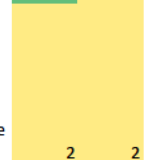
I was working in the Lab in this morning during an atraumatic restorative therapy workshop as part of requirements for 4th year dental hygiene students. I was instrumenting a simulation tooth when my instrument slipped and cut the tip of my left middle finger. I immediately stopped, washed my hands, got a bandaid, and reported this incident to my instructor. The injury was small and caused minimal damage.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no Fingers yes

Did not receive any further medical attention

Faculty of Medicine & Dentistry



2022 cut

Animal was being put to euthanized in chamber reached out and bit index finger on right hand. 2 wounds on finger present. Wound was quickly washed with soap and disinfected with Etoh 70% and dressing applied. Bite took place in [REDACTED] 3-043.	Other	Injury/Illness (Including sprains and strains)						Faculty of Medicine & Dentistry	2	2	2022 bite
Resident during the CASES resident training lab involving live swine, had a needle strike while practicing suturing. Individual was *. First aid was administered (wound was cleaned with soap and water) * was advised to watch the would for infection in the coming days and to seek medical attention if this occurs. This Occurred at the [REDACTED] located at [REDACTED] Please contact * at * for more info.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)	Biological	Cut/Laceration/Puncture		yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2021 k needlestick
A glass vial containing a research sample in a methanol-dichloromethane (1:99 v/v%) solution broke while the student * was handling it. Spills occurred on her safety glasses, face and lab coat. After the incident occurred, the face was rinsed thoroughly with water and soap.	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Contact		yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2021 chemical
Local anesthetic needle. Did not rip glove, unsure if broke the skin on left hand thumb.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no	Hands	no	Faculty of Medicine & Dentistry	1	2	2021 k needlestick
I cut the tip of my left index finger while wiping wax off the microtome blade holder with a tissue.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no	Fingers	yes	Faculty of Medicine & Dentistry	2	3	2021 cut
My (Dr *, Oncology, [REDACTED] Facility) PhD student * cut one of her fingers accidentally with a sharp piece of laboratory glassware at approximately noon today. My PhD student * attended the injury and provided first aid by putting a bandage around the affected finger to stop the bleeding. The cut seemed to be deep and not superficial. I used my personal car and drove * to the [REDACTED] Institute where she asked for first aid. Yinglan was feeling well and was not suffering from any side effects originating from the cut.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no	Fingers	yes	Faculty of Medicine & Dentistry	3	3	2021 cut
Diphotherine (emergency chemical burn rinsing solution) in 7-045A [REDACTED] is expired. Lab is replacing.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition						Faculty of Medicine & Dentistry	1	1	2021
While cleaning out a glass beaker in the sink of the respiratory suite [REDACTED] facility), the beaker had slipped from my hands into the sink and cracked/broke into about 5 pieces. The beaker had originally contained 5% microchem disinfectant which was used to rinse out surgical utensils and was being washed/rinsed with additional 5% microchem. My gloves were not broken and all pieces from the beaker were collected and placed into sharps container.	Near Miss or Unsafe Condition	Property Damage						Faculty of Medicine & Dentistry	1	1	2021
While reaching into a cage to pick up a rat, the rat turned and bit my ring finger of my right hand causing the glove to break and a wound to open up and bleed. I immediately washed the wound at the sink and put pressure on it to stop the bleeding. When the bleeding slowed I was able to put a band-aid on it and continued work.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no	Fingers	yes	Faculty of Medicine & Dentistry	2	2	2021 bite
Nov 9/21 received an email from staff member indicating an animal cage filter top was not placed on properly (cage was unsealed), and the cage contained animals that had been exposed to a chemical hazard - Tamoxifen. Lab personnel were notified of the incorrect placement and will be more diligent in the future.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition						Faculty of Medicine & Dentistry	1	2	2021

I was working in the lab with early diffuse systemic sclerosis patient sample. Sample type is dermal fibroblast cells. Sample was in RLT lysis buffer (RLT+B-mercaptoethanol). I was homogenizing sample with 27g needle for RNA extraction. Suddenly needle poked into my left hand number 3 finger. it was bleeding. Then I washed blood with ethanol and put band aid on it.	Exposure to Hazardous Substance Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	Biological	Absorption/Skin Contact	no	Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2021	needlestick
Undergraduate project student (*) working in the * Lab in the * building had a needle stick injury. While removing porcine blood units from a bag, an uncapped needle from the collection set poked her finger leading to a small bleed.	Exposure to Hazardous Substance Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	Biological	Cut/Laceration/Puncture	no	Hands	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2021	needlestick
Rat and Mouse allergies over time. I have been getting immune therapy for about 5 years now.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			yes	3 to 10 days	Other Eyes	no	Faculty of Medicine & Dentistry	3	4	2021	allergy
Nov 2, 2021, approx. 1700hrs, wash disinfectant 3 conveyor didn't pull basket into washer. I pushed the basket in and felt a sharp pain. As I continued to work my lower back became very painful. I finished up my task in decontam around 1900hrs. I told my fellow co-worker that I was going to go home as my back was hurting quite a bit. My shift started at 1300 hrs and I was suppose to finish at 2100 hrs.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			yes	Unknown	Back	no	Faculty of Medicine & Dentistry	3	3	2021	strain
I was discarding the 10% bleach washed and air-dried glass pipettes. One of the pipettes was in vertical position and injured my thumb.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Fingers	yes	Faculty of Medicine & Dentistry	2	3	2021	cut
Removable final impression. Student cut self with dirty scalpel trimming final impression material. Contaminated with saliva. Student: *	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Fingers	yes	Faculty of Medicine & Dentistry	2	3	2021	cut
I was picking up a single housed rat. The animal turned and bite down on my left ring finger at the first joint.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Hands	no	Faculty of Medicine & Dentistry	2	2	2021	bite
Our student, * was bitten by a mouse during training with [REDACTED] (for part 2 mouse handling training). A 96 well plate containing SARS-CoV2 was dropped when being transferred from the hood to the incubator. The plate contained ~ 25 pfu/well in 50uL/well, ie <2500 pfu in under 5 mL total volume. The affected floor area was covered in 5% microchem, which was then wiped up with paper towels. 70% ethanol was also sprayed over a larger area to reach any smaller droplets that may have been produced. Also, the outer gown was sent for autoclaving.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Fingers	yes	Faculty of Medicine & Dentistry	2	2	2021	bite
	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition							Faculty of Medicine & Dentistry	1	2	2021	
Animal (rat) bite. A rat was being picked up for weighing and turned around and bit the index finger of the handler, *. She washed the finger/wound with soap and water and dried it, then placed a band-aid on the site.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Fingers	yes	Faculty of Medicine & Dentistry	2	3	2021	bite
During a lab cleanup, a drawer was opened and a small amount of free elemental mercury was observed at the bottom of the drawer. An email was sent to EHS asking about the availability of a mercury spill kit. The spill kit was dropped off by Dr. * with instructions on how to proceed with clean-up. I was advised to submit an incident report, and advised on how to properly dispose of the Mercsorb amalgamation powder once cleanup was complete.	Environmental Release	Environmental Release							Faculty of Medicine & Dentistry	1	3	2021	

Spill: Bleach treated tissue culture liquid waste (containing cell culture media, growth factors, PBS). While attempting to disassemble the vacuum system to dispose of the cell culture liquid waste, the waste container was knocked over and spilled into the biosafety cabinet and onto the student disassembling the vacuum system. The student was wearing gloves and a lab coat at the time of the spill. They removed their gloves, washed their hands thoroughly with soap and water, then cleaned up the spill.

Exposure to Hazardous Substance    Exposure to Hazardous Substance    Biological    Absorption/Skin Contact    no

Faculty of Medicine & Dentistry

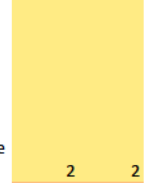


2021 chemical

I was in the shipping area of our loading dock where animals are received / unpacked. There are numerous animal racks / empty cages set up, and they're covered with clean sheets while waiting for animals to arrive. I accidentally stepped on a corner of the sheets, and one of the empty rat cages was knocked off the rack. It hit the right side of my left hand on the joint with my index finger. There was no broken skin, but I had been receiving previous physical therapy for joint pain in this hand (previous WCB claim.)

Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)    no    Hands    no

Faculty of Medicine & Dentistry



2021 drop

I am the Research Associate/Lab Manager with Dr. \* (\*). Our undergrad lab student, \*, was hit on the head by the lid of a dry ice bin last Friday, which likely caused a concussion. She is doing well, but is resting at home. Here is the detailed description of the incident that \* provided me: "On Friday September 17 around 11:30 AM, I went to refill dry ice in the room adjacent to the Biology Store (354 Building) where dry ice is stored in a blue bin. I was getting dry ice to transport my samples and section them on the physiology cryostat machine located on the 7th floor in the Biology Building. I was accompanied by \*, a PhD student from the \* Lab. \* entered the codes to purchase dry ice in the computer system while I filled up my box. The dry ice blue bin had wheels on it and was near a wall. I opened the lid and rested it against the wall. I leaned forward halfway (90 degrees) to reach and scoop dry ice with a big scoop that was in the bin for use. I had to lean this far forward as the dry ice was quite deep in the bin for my stature (my height is 5ft2"). In doing so, I accidentally nudged the body of the bin further towards the wall, causing the lid (which was resting against the wall) to slam shut on the back of my head. This happened pretty quickly. By mere judgement the lid was probably 5-10lbs and there was nothing built into the lid to make it close slowly. Following the incident, I moved the bin a further distance off the wall and opened the lid much more to scoop dry ice a second time. I had a minor headache but didn't react to it at the moment and I didn't think much of it. As the headache worsened and persisted over the weekend I saw a doctor and was told I likely have a concussion."

Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)    yes    Unknown    Head    no

Faculty of Medicine & Dentistry



2021 drop

During overtime I was pulling a heavy metal filter frame holding Hepa filter and it was sticking (located on the ceiling). I was removing the frame to take the Hepa filter out. I pulled hard to remove it and the corner of it hit me in the middle of the forehead.

Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)    yes    Less than 3 days    Head    no

Faculty of Medicine & Dentistry



2021 drop

<p>While emptying a lab garbage can (by tying off the garbage bag to place in the disposal bin), a needle stick occurred. The needle pierced the skin at the 1st knuckle of the middle finger on the left hand of the gloved student. He washed his hands 4 times with antibacterial soap. The needle was still attached to the syringe barrel and incorrectly placed in the regular black garbage despite there being an appropriate sharps disposal bin right beside the garbage. The garbage was within a biohazard room in the animal facility (rodents - mice) and the contents of the rest of the garbage were that of a surgical animal suite - including paper towels, gauze (some contaminated with rodent blood), rose bengal (cas. no 632-69-9) and dental cement compound.</p> <p>I pulled my thumb at work, I don't remember exactly what I was doing. The pain went away and I didn't think to much of it. Next day the hand was a little stiff. The second day after my wrist was stiff and the hand was sore. Then By the third day I had to go by a brace for my hand and wrist as it is too sore to move it.</p> <p>A mouse bite through a glove and punctured the skin of student *. A small amount of blood appeared. The wound was washed thoroughly, disinfected, and a bandage applied. No swelling was noted at the site or other parts of the hand or body. No other adverse reaction has been noted. I am monitoring *for swelling or other reactions hourly. * will go to obtain a tetanus shot.</p>	<p>Exposure to Hazardous Substance</p> <p>Injury/Illness (Including sprains and strains)</p> <p>Injury/Illness (Including sprains and strains)</p> <p>Injury/Illness (Including sprains and strains)</p> <p>Injury/Illness (Including sprains and strains)</p>	<p>Injury/Illness (Including sprains and strains)</p> <p>Injury/Illness (Including sprains and strains)</p> <p>Injury/Illness (Including sprains and strains)</p> <p>Injury/Illness (Including sprains and strains)</p>	<p>Cut/Laceration/Puncture</p> <p>Biological</p> <p>Chemical</p> <p>Needlestick</p> <p>no</p>	<p>Fingers</p> <p>Hands</p> <p>Hands</p> <p>Fingers</p> <p>Fingers</p>	<p>no</p> <p>no</p> <p>Less than 3 days</p> <p>no</p> <p>yes</p> <p>no</p> <p>no</p>	<p>Did not receive any further medical attention</p> <p>University Health Centre</p>	<p>Faculty of Medicine &amp; Dentistry</p> <p>Faculty of Medicine &amp; Dentistry</p> <p>Faculty of Medicine &amp; Dentistry</p> <p>Faculty of Medicine &amp; Dentistry</p>	<p>2</p> <p>3</p> <p>2</p> <p>3</p>	<p>2</p> <p>3</p> <p>2</p> <p>3</p>	<p>needlestick</p> <p>2021 k</p> <p>strain</p> <p>bite</p> <p>cut</p>
<p>* came in to work between 8:45 -9am (estimate) to drop off food in the lunch room. She opened the fridge, put in her food and came into the lab to work in the desk in room 4021 to work on her lap top and on the lab desktop There was no pineapple in the fridge (this is something that she has an allergy to). There was no lab work being conducted at the time and she did not do any lab work. At 9:30, she came into the lunch room where I was and said that she was itchy and that her hands felt heavy. I brought her with me back to the lab as I had some antihistamines (Reactine). She began to breathe shallowly and was getting too tired to move so I had her sit where she was (in the hallway), while I got the antihistimine from my desk. I gave her the medicine and then called Control center at the They told me to call 911. I waited with the operator while another colleague waited with in the hallway. The Peace officers, fire dept and ambulance came within 10-15 minutes and they took her to emergency at about 10am.</p>	<p>Injury/Illness (Including sprains and strains)</p>	<p>Injury/Illness (Including sprains and strains)</p>	<p>yes</p>	<p>Other</p>	<p>no</p>	<p>Faculty of Medicine &amp; Dentistry</p>	<p>3</p>	<p>3</p>	<p>2021 allergy</p>	
<p>An authorized person (*) brought an unauthorized person (*) into the level 2 biocontainment facility. After determining this person was not authorized to be there, I gave permission for them to stay since I was working in the immediate vicinity. Unfortunately I stepped away to assist another member from the same lab group (all from Dr. * lab) and I came back to find that the unauthorized person, upon instruction from the authorized person, in the hallway wearing full PPE which is a breach of protocol.</p>	<p>Near Miss or Unsafe Condition</p>	<p>Near Miss or Unsafe Condition</p>				<p>Faculty of Medicine &amp; Dentistry</p>	<p>1</p>	<p>3</p>	<p>2021</p>	
<p>Technician was disposing of plastic syringes which he thought had no needles attached. But mixed in with the needle free syringes were some with the needle still attached. In transferring the syringes for disposal he was stuck by a needle. The syringes had been used solely to transfer non hazardous saline solution and no human fluids were involved. The technician then went to a physician to have the injury examined.</p>	<p>Injury/Illness (Including sprains and strains)</p>	<p>Injury/Illness (Including sprains and strains)</p>	<p>no</p>	<p>Hands</p>	<p>yes</p>	<p>Emergency Department</p>	<p>Faculty of Medicine &amp; Dentistry</p>	<p>3</p>	<p>3</p>	<p>needlestick</p> <p>2021 k</p>

Accidental stabbing of lower inner side of left hand with an unsterile glass pipet contaminated with lentivirus-transduced cancer cells (mantle cell lymphoma) during sample preparation for cell sorting under laminar air flow hood, safety gloves were worn but pipet cut through gloves into hand	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Hands	yes	Family Physician or Walk-In Clinic	Faculty of Medicine & Dentistry	2	3	2021 cut
*, a graduate student in my lab, poked herself with a needle used in Enchehalomyocarditis Virus D-infected mice. * was processing mice in the Biocontainment facility. She went to remove the scale used to weigh the mice when he poked herself with an un-capped needle used in infected mice. The needle went through the 2 gloves and a droplet of blot came out. She washed the wound with soap and alcohol. put on a bandaid and continued processing other mice. I was informed about an hour later.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)	Biological	Cut/Laceration/Puncture	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2021 k needlestick
During sacking the mice infected with in the Biocontainment MB16, after flashing the heart with a 21 gauge syringe, accidentally I got a prick, and a little bit of blood came out. I washed my fingers immediately with running tap water and an alcohol swab. Then put a bandage.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)	Biological	Cut/Laceration/Puncture	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2021 k needlestick
On Wednesday, July 7, at 12:20 PM, the trainee was preparing SDS-PAGE gels for an immunoblot blot. They poured the stacking Buffer (H2O, Tris 0.16 M pH 6.8, Acrylamide 6%, SDS 1%, APS 0.1%, 0.00006% TEMED) and then as they were inserting the comb, a small amount of liquid splashed into both their eyes. This trainee usually wears safety goggles provided by the laboratory for every experiment, but forgot to wear them at that particular moment. They had removed them to briefly go to their desk and forgot to put them back on when resuming the experiment. They immediately started washing their eyes under running tap water and next used the emergency eye wash bottle in the lab. Then, they went to the eye wash station in the hallway and washed their eye for about 15 minutes. The trainee felt a burning sensation in their eye even after washing and decided to go to the health center. They were prescribed saline eye drops and sent home. Eye burning sensation and redness disappeared after 2 days.	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Contact with eye/nose/mouth	no		Faculty of Medicine & Dentistry	3	3	2021 eye
* was transferring a pellet of bacteria from a 1L centrifuge bottle to a 50mL conical tube using a metal scoopula. While transferring the pellet from the scoopula to the 50mL conical tube, a small droplet landed on her glasses. * was concerned about how close the droplet was to her nose and washed her eyes and face with the eye wash wand at our main sink. There was no exposure to her eyes and she was wearing glasses and all required PPE while doing the experiment. This would be categorized as a near miss.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition					Faculty of Medicine & Dentistry	1	2	2021
I was injecting a Diphtheria toxin syringe (30gauge needle, 10ug/ml) Intraperitoneally in the mouse. I accidentally poked myself as the mouse pushed the needle onto my hand. I didn't inject. I then removed the gloves, bloodlet for a couple minutes under water and then washed then washed the area with soap and water. I then followed the Infectious Agent Exposure Protocol but I couldn't get hold of anyone. I then called healthlink and eventually admitted me to the ER.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)	Biological	Cut/Laceration/Puncture	yes	Emergency Department	Faculty of Medicine & Dentistry	3	3	2021 k needlestick



On Sunday May 16, I received a request from a travel microscope confocal user for help. She couldn't acquire images. I helped her over the phone to diagnose that the camera on the system was not working and she sent me an image from her phone that looked like water had dripped on the system. I asked her to logout and just to leave everything the way she found it. On Monday, May 17, I was able to turn the entire system off and then on again and the system was functional "apart from a loud noise coming from the cooling fan on the camera. I contacted the [redacted] plumber and showed him the issue. He spent the next few days investigating the situation and coordinating access to the space above [redacted] B-120G, so he could diagnose and fix the problem. On May 20, the plumber discovered a major leak in the hot water supply line due to galvanic corrosion between the copper piping and the metal pipe hangers. During the repair, unfortunately, many litres of water made their way into [redacted] B-120G and fell onto the microscope and surrounding area. Despite the protective plastic sheeting that was placed over the system, water completely destroyed the computer and came in contact with several other components of the microscope. After removing power from the computer and allowing it to dry for 5 days, I attempted to restart the computer. Although the fans in the computer turn on, the system does not boot. This computer is the brain of the system, acting as the central integrator for all the associated microscope components. Each component of the system communicates with the computer through its own PCI card. None of these cards are functional. We have received a quote (attached) from the original vendor of the microscope to supply a new computer with all of the required PCI cards to establish communication with the microscope components. Without a functional computer, I cannot ascertain the functionality of the rest of the hardware components of the microscope. I was able to turn on the various components

Property Damage Property Damage

Water and detergent from contractors cleaning a static line entered the compressed air system in the [redacted] Building. Through the compressed air system, the water flooded the two autoclaves supporting the [redacted] Facility and the air bladders on the submarine doors of the [redacted]'s Equipment Lock. The water damaged several components in the autoclaves and they had to be taken off-line until replacement parts can be sourced. With no functional autoclaves, the [redacted] Facility had to be temporarily shutdown disrupting essential COVID-19 projects for over half a dozen research groups. Earliest estimate to get at least one of the autoclaves back in operation (and thereby allowing the [redacted] facility to reopen) is Friday, June 18th. Damages to the Equipment Lock doors is still being assessed but it is confirmed there is water in the air bladders and they may need to be replaced which will require another shutdown of the [redacted] facility.

Property Damage Injury/Illness (Including sprains and strains) Property Damage Injury/Illness (Including sprains and strains)

I was removing the grated slate flooring from the pig pen in MB69 when the flooring fell onto the top of my left foot.

Less than yes 3 days Feet no

Slipped on slippery floor. There was instrument lubrication spill on the floor earlier in the day, it was cleaned up, but still left a slippery residue. I was working on my normal daily tasks duties and walked in the area that the spill occurred and my foot slipped on the slippery floor out in front of me, I was able to grab the table that was beside me to prevent me from falling onto my knee which would have caused further severe injuries. When my foot slipped I jarred backwards grabbing the table causing a tense jolt in the rest of my body.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no Other no

Faculty of Medicine & Dentistry

2 2 2021

Faculty of Medicine & Dentistry

2 3 2021

Faculty of Medicine & Dentistry

3 3 2021 drop

Faculty of Medicine & Dentistry

1 3 2021 fall

Multiple cages were changed without the addition of PPE required. The yellow hazard labels were removed at some time. May 5th the cages were used by Dr * and Dr *. May 6, 2021 was the date of cage change by *.	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Contact with eye/nose/mouth									
Approximately 2-3 cages Mice injected with Dox. Supervisor: * Slipped in wet pig food and debris that had accumulated in the animal housing pen and injured my back during regular husbandry. My muscles were already aching/fatigued from strenuous work onsite and at home from the day before.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			Back	no						Faculty of Medicine & Dentistry	1 2 2021 chemical
	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			Back	no						Faculty of Medicine & Dentistry	2 2 2021 fall
* cut herself	Near Miss or Unsafe Condition	Injury/Illness (Including sprains and strains)			Hands	yes	Less than 3 days	Did not receive any further medical attention				Faculty of Medicine & Dentistry	3 3 2021 cut
appears to be repetitive strain injury	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			Other	no						Faculty of Medicine & Dentistry	2 3 2021 strain
I injured myself at work and experienced lower back injury. I worked as a Laboratory Assistant cage wash and responsible in processing all the dirty supplies that's been used by the animal care technician and PI's. I started my work at 8am, organizing and filling up of dirty cages and dismantling cages coming from the PI rack. As I was processing and picking up a stack of dirty cages from the floor at around 9am I felt a pain in my lower back in picking up the cages. At first I just ignore it and thought that it was nothing but as time goes by I'm feeling a pain and having a hard time in bending over and picking up stuff like cages on the floor. I reported the incident to my supervisor at around 11:30am of April 20, 2021.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			Back	yes	3 to 10 days					Faculty of Medicine & Dentistry	3 3 2021 strain
A 4L amber glass bottle containing approximately 3L of methanol fell and broke on the floor. The spill covered 1 x 2 metre area and was quickly contained and cleaned up with paper towels and the waste containers placed in our fume hood. The glass was discarded in a glass waste container. The student's shoes were also spilled on, therefore removed and their feet were washed with soap and water. Direct affected parties: *	Exposure to Hazardous Substance	Exposure to Hazardous Substance										Faculty of Medicine & Dentistry	1 2 2021 chemical
Overnight flood from a broken pipe that lifted tiles in the main lab, office and side room.	Property Damage	Property Damage										Faculty of Medicine & Dentistry	1 3 2021

Throughout January- March 2021 the lab injected Doxorubicin into their mice in LB51. The lab performed all cage changes and dealt with all food/water. However they failed to contain and deliver these cages to cage wash properly and returned them as normal cages. Thus there is a potential exposure to 4 Cage wash staff, when handling the dirty cages on February 4.21 and March 23.21. Additionally there was an exposure to 1 Animal Care Tech, when a mortality was discovered and the dead mouse removed from the cage on April 1/2021. Doxorubicin, when exposed to the full product, is considered a Moderate Health Hazard, level 2. Defined as a hazard that has the potential to cause health issues upon prolonged or continuous exposure. Doxorubicin is an irritant to the eyes and respiratory system. If the chemical was not metabolized, the maximum exposure from each cage would have been 0.06ml and there were a total of 5 cages, therefore each cage wash exposure was potentially 0.3mls. The exposure to the person handling the dead mouse would have been a maximum of 0.06 mls. But of course your exposures were to the metabolized chemical. The dose used in the mice was 4.5 mg/kg and the LD50 dose (dose needed to kill a mouse) is 570 mg/kg. The highest risk still remained with the lab technician. This incident was disclosed/discovered April 2/2021 to the [REDACTED] Clinical Vet. \* then took over the investigation. WCB Employee reports will be submitted for each of the exposed employees.

Incident Description	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical Contact	Contact with eye/nose/mouth	Inhalation	Absorption/Skin	Faculty of Medicine & Dentistry	2021
Exposure to Hazardous Substance	Exposure to Hazardous Substance		Chemical Contact	no			Faculty of Medicine & Dentistry	1 2 2021 chemical
Cut the thumb with a scalpel . Scalpel was used to cut the wax, which was in the mouth during bite registration	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)	Human blood or bodily fluids	yes	Did not receive any further medical attention		Faculty of Medicine & Dentistry	2 3 2021 cut
On March 24,2021, at 11:30 in the morning I work in [REDACTED] Clean Cagewash, i have a two Ventilated Rack to push inside the autoclave it was a bit hard to push then suddenly my back was forced	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)		no	Back	no	Faculty of Medicine & Dentistry	2 3 2021 strain
While cleaning out some lab drawers, a broken mercury thermometer was found. Mercury from the thermometer spread in droplets throughout the base of the drawer, but appeared to be contained within the drawer. The drawer was carefully removed and placed in the fumehood and EHS was contacted in order to determine next steps. As a mercury clean up kit was not available on the floor, EHS put us in contact with the Department of Chemistry. A mercury clean up kit will be obtained from the Dept of Chemistry and will be used to clean up the spill.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition	Chemical				Faculty of Medicine & Dentistry	1 3 2021
I was putting a tissue culture plate back into the incubator (cells in plates are infected with horsepox virus) on top of a stack of plates that were already in there. As I was putting the one I was holding on top, I was slowly pushing one of the other plates off the stack without noticing it. Just as the plate was about to fall off, I caught it, but about 5ml of media spilled into the incubator. The spill was contained in the incubator, but just to be safe, I wiped down my gloves, replaced the second layer, then wiped down all the plates with 70% ethanol, then pulled everything out of the incubator and gave it a good clean with 5% Microchem followed by 70% ethanol.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition					Faculty of Medicine & Dentistry	1 2 2021

Opening a sterile scalpel in biohood. After snapping off the safety while pulling scalpel out of the package the scalpel cut through the packaging and cut tip of thumb through glove. Took hands out of hood, de-gloved, washed hands, let blood run freely for two minutes. Put compression on it then bandaged.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2021 cut
I had just finished staining slides and was cover slipping them. After picking up a clean cover slip with my left hand (held between my thumb and index finger), I was flicking/bending the top of it with my right index finger to ensure that I had only one cover slip and not 2 on top of each other. The cover slip snapped and a small fragment stuck in my left thumb pad. It was shallow and only a small amount (a drop or two) of blood came out. I removed the fragment, removed my gloves, told my instructor (*) what had happened, washed my hands, and applied a band aid. There was no further blood. I went back to cover slipping as soon as I finished putting on the band aid.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2021 cut
Friday, Feb. 5, 2021, I was working at [redacted] Group building assigned i Clean cage wash area. About 10am after morning break, a sudden but gradual pain felt on my left ankle but I managed to finish my shift up to 3:30 in the afternoon. As far as I remember, there's no incident happened related to work due to this.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Less than 3 days	Feet	no	Faculty of Medicine & Dentistry	3	3	2021 strain
The incident was happened in the room B92 of our [redacted] facility. While I was receiving a stock of 12-well plates from incubator to infect them in Biosafety cabinet, I lost grip of the very bottom plate and the tray of plate dropped to the floor. Those are un-infected Vero cells with regular tissue culture media. I sprayed 5% Microchem solution from outside of the spilled area inwardly. Wiped the spilled area from outside inwardly with paper towels. Sprayed the area with 5% Microchem again and wiped it with paper towels.	Other	Property Damage					Faculty of Medicine & Dentistry	1	1	2021
On 28/Jan/2021, I was trying to open a cassette in the assembly side of central sterilization area, unfortunately an instrument was sticking out and my left index finger got a prick from that particular instrument and started mild bleeding.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2021 cut
Today I was working in the [redacted] facility . . . As I was doffing my inner pair of gloves in the change room I noticed a brownish substance (possibly dried blood) around my left middle finger nail bed. I then noticed that the side of my middle finger had been sliced, although no blood was present. I inspected my inner glove and couldn't find a nick in the glove at this area. I proceeded to remove the remainder of my PPE and wash my hands thoroughly with soap and water. I then proceeded to exit the [redacted] facility. When I got back to my laboratory area, I again washed the affected area well with soap and water. I then proceeded to put a bandaaid on the finger.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)					Faculty of Medicine & Dentistry	2	2	2021 cut
In [redacted] we are processing cage equipment for animal that includes pushing carts, racks and bins ( with cages inside). Also our job includes a lot of bending and carrying. I develop back pain on my lower back (left side) overtime.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Back	no		Faculty of Medicine & Dentistry	2	3	2021 strain
As I was transferring multiple cages from one flat deck to another felt a sudden sharp shooting pain on my lower back then in the afternoon got worsen the pain radiated towards my lower extremities.	Other	Injury/Illness (Including sprains and strains)					Faculty of Medicine & Dentistry	2	2	2021 strain
started out as an occasional burning sensation in my left elbow (before Christmas). Over time the burning sensation has started to occur more often. it is now starting occur when I only extend my arm (not holding anything) and twist the arm.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Other	no		Faculty of Medicine & Dentistry	2	3	2021 strain

Overhead HWS Pipe burst, spraying equipment below. Leak discovered at ~1:30 pm; I do not know when it started (sometime between Sat Jan 2 and Monday Jan 4). No Biohazards or chemicals were involved, no acute injuries. The pipe was repaired and water was cleaned from the floor and tables in the area. Some electronic equipment was exposed to the water stream for an indeterminate amount of time: There were two PCR machines, 2 power supply units, a centrifuge, a microwave oven, a hand-held UV illuminator, and a Zeiss stereo fluorescence microscope that were either soaked or sprayed. These items have been moved, switched off, and are currently drying out; specific damage has not been assessed yet.

Property Damage Property Damage

Faculty of Medicine & Dentistry



2021

A sprinkler was triggered while work was being done in the 1-22 cold room. The work was contracted by \*. The contractor was recommended by in 2018 when compressor work needed to be done for our facility and is used throughout the University on various related jobs. The incident caused water to pool into first floor corridor and was vacuumed and cleaned with the help of the building staff. A small amount of water went into the BSE Containment 2+ lab (room 1-23) and was mopped immediately. The water was then decontaminated and disposed of in accordance to biosafety guidelines. There was minor water damage to baseboards and drywall in the first floor of however no equipment was effected.

Other Property Damage

Faculty of Medicine & Dentistry



2020

Went to recycle some plastic in one of the brown recycling bins out in the hallway of 3rd floor and discovered the strong smell of Trizol and tissue culture waste (dishes/plates). Also found a 50mL tube with about 20mL of formalin inside. Contacted EHS, sent a picture. \* came to investigate and he will provide a Biobox for me to transfer all of the items from the recycling bin to the Biobox for proper disposal.

Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains) Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains)

Faculty of Medicine & Dentistry

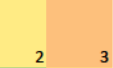


2020

pAIN ON THE RIGHT UPPER EXTREMITY WITH NUMBNESS AND A SLIGHT LOSS OF SENSATION OR WEAKNESS.

no Other no

Faculty of Medicine & Dentistry



2020 strain

12-111 is a registered BSL-2 tissue/cell culture facility (\* is the PI). In a yellow bio-hazardous pail (both word and hazard symbol on the outside of the pail) we place a clear garbage bag to collect our TC waste from the BSC before sealing the full bag and placing in the cardboard Chematix disposal boxes. On the evening of EITHER Mon Oct 26 or Tues Oct 27th that full bag of biohazardous tissue culture waste (plastic pipets, tissue plates/flasks, pipet tips, syringes (no needles!) and filters, plastic collection tubes 1.5-50ml etc) went missing and was discovered around noon on Wed Oct 28th by lab staff (\* listed below). The yellow bio pail had a black garbage bag replaced in it (in a size not available in our lab). All this waste was contaminated with primary mouse brain tissue cultures/isolated cells from primary mice tissue not treated with any other bio-hazard agents (ie like LPS which is used in that room, but not on this set of current experiments).

Exposure to Hazardous Substance Environmental Release Near Miss or Unsafe Condition Near Miss or Unsafe Condition Biological

Faculty of Medicine & Dentistry



2020

This incident is being reported on behalf of [REDACTED] animal care staff - \* and \* who discovered the flood water in the basement of the [REDACTED] [REDACTED]. On October 15th at 7 50 am, the animal care staff found clean water backing up from the floor drains. Multiple rooms throughout the basement are affected with the bulk of the water being in the autoclave/cage washer area [REDACTED] B-10 and B-08 (approximately 5 cm deep in some areas). Water was not coming from any equipment or taps in the area. F&O was notified and arrived within 15 minutes to start water clean up and investigation, the plumber arrived a short time later to start snaking the drains. The mechanical room in the sub basement below was also checked. There was no water on the floor, the sump pumps were working and their tanks were not full. Water was also found inside the TSE2+ containment area [REDACTED] B-19ZZ) seeping up through the sealed floor drain under the chemical shower. Water inside containment is being collected in buckets. The containment barrier was not breached. By 12pm - no cause or resolution identified yet, water is still slowly backing-up through the floor drains and clean up efforts to manage the water continue. There are also early signs of water starting to seep through the sealed floor drain in [REDACTED] B15B but no significant accumulation yet.

	Other	Property Damage						Faculty of Medicine & Dentistry	1	2	2020
On October 13, 2020, I got a minor punctured wound from a naive rat while changing cages. The rat was new to the facility and was not handled long enough. The injury was on my left hand, on my smallest finger.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention		Faculty of Medicine & Dentistry	2	2	2020 bite
Needle stick injury (possible)	Other	Injury/Illness (Including sprains and strains)						Faculty of Medicine & Dentistry	2	2	2020 k needlestick
* went to administer Doxorubicin (10mg/Kg) on to mice in our animal conventional room [REDACTED] BS 41). While attempting the injection, one mouse kicked and * poked herself superficially (no blood), without actually administering any of the drug. * washed her hands thoroughly and reported the incident. * called [REDACTED] Poison & Drug Information Services immediately after. [REDACTED] had no concerns, as the dose would be too low to cause damage. * will be closely monitored in case of discomfort or illness.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)					yes	Faculty of Medicine & Dentistry	2	2	2020 k needlestick
last Tuesday when I was working on the Dirty Cage wash I felt a sore on my lower back while lifting a bag of dirty beddings. It was aggravated and get worse last Tuesday while working on the Clean side area while doing lifting and pushing stuff.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Back	no			Faculty of Medicine & Dentistry	2	3	2020 strain
Staff member, * near fainting, unable to walk afternoon in her lab (work space). Feeling faint and breathing became shallow. Security was alerted - CCI security called a code blue in the building and then 911 was called. The employee is being taken by ambulance to an [REDACTED] emergency department.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Unknown	Other	yes	Emergency Department	Faculty of Medicine & Dentistry	3	3	2020 medical

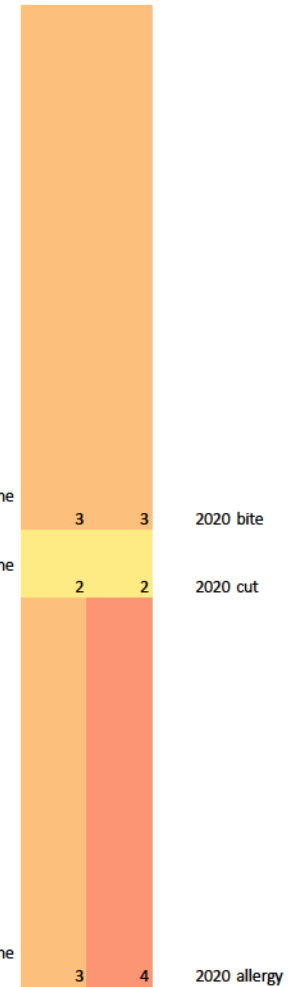
I am writing this report as supervisor for \*, a summer student of my colleague, Dr. \* with whom we are collaborating on an animal based research project (██████). I have contacted \* and Dr. \* since the incident and have come to learn that around noon today, \* was returning the rats that she had been running on a treadmill in our lab (5-30 ██████). Upon returning the rats to ██████ the cart in which they were on had a wheel break as it was being pushed from the elevator to the ██████ hall (██████ B20). The cart lurched and several cages on the top shelf fell. Two of the cages opened and the 4 rats were released into the elevator. \* acted quickly to put them back into their cages but she received multiple (I am told at least 4) bites on her hand. ██████ Technician \* helped \* put the rats back into their cages, steady the cart and clean up the mess from the open cages (feces, cage bedding). \*, ██████ supervisor, was called by \* and \* cleaned her wounds in the public washroom. The rats were moved to their appropriate room in ██████ except for the 2 cages that were compromised. Dr. \* was called and directed \* to the Health Clinic to ensure she was properly assessed. Dr. \* retrieved the broken cart from ██████ and after receiving permission from ██████ put the rats from the compromised cages into the separate cages into ██████ B57. I was informed at 2:30pm and I called \* directly to inquiry about her safety and mental health status.

Administration of Zofran 4mg/ml ampule. When opening one of the ampule, cut side of finger due to the cracked glass on the ampule.

I had an allergic reaction at work on July 28/2020 while performing my normal duties as an animal care technician. I was working in a room where mice are housed (LB41 - ██████ basement) and started to experience minor symptoms at first around 9am. I had a runny nose, sneezing, itchy skin and throat, and eye irritation. This eventually progressed to severe sinus pressure and pain to the point where I could no longer wear my required PPE or stay at work. I went to my supervisor and told her I needed to leave around 11am and was sent WCB paperwork electronically. Incidents like this have happened numerous times over the last 5 years at this job as I have developed significant allergies to the lab animals. This most recent time I went back to my doctor again and after seeing the reaction I was provided with a letter to give to my department stating that I should not be working in that role anymore/directly with animals. As a result, I have been off work on general illness leave ever since, pending approval of my case with WCB.

Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers Hands	yes	University Health Centre	Faculty of Medicine & Dentistry	3	3	2020 bite
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2020 cut

Other	Injury/Illness (Including sprains and strains)					Faculty of Medicine & Dentistry	3	4	2020 allergy
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I had been given a set of older Urine tubes that were for practice for students to look over microscopically. At the microscope, I was looking at a tube with both hands and checking the label. I had noticed that the tube was slightly wet and the cap was not fully pressed down but I thought this was due condensation from the sample being in the refrigerator. While holding with both hands, the tube slipped out of my fingers on my right hand and the snapping force of me trying to hold onto the tube was enough to cause some of the liquid that was on the outside of the tube to fly onto what felt only my eyelash but not into my eye. I put the tube down and looked at my gloves to see small amounts of the same urine sediment stain used for the specimen tubes. I made the connection that the liquid on my eyelash was possibly from the specimen. I informed the techs that were in the same area as me and I went to the eyewash station to rinse out my eyes. The techs at that time gave me a number to call to report this type of incident. I called and the nurse on the other end stated they would write up a report on this situation. She then told me that because it landed on my eyelash and not directly into my eye, there would be no follow up to the incident but a report was still needed. She then told me that red blood cells in the specimen would require a follow up to the incident due to pathogens. I then headed back to the lab and asked a tech to look at the sample. She did not find any red blood cells within the sample. When my preceptor returned from her meeting, I informed her what happened and asked as well for her to make sure about the specimen. She also came to the same conclusion and did not find any red blood cells. I tried to wash my eyes the best I could. During the incident, it did not feel like any sample landed directly into my eye nor after washing them there was any alarming discomfort.

burst blood vessel on left hand ring finger . Must have pinched it moving equipment. Not noticed until it started to swell It healed after a week

Worker, \* reported pain in his left shoulder and some numbness in his arm. He stated that is a progressive injury

Exposure to Hazardous Substance	Exposure to Hazardous Substance	Biological	Contact with eye/n	Outcome	Other
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	no	Fingers	no
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	no	Other	no

Faculty of Medicine & Dentistry	2020 bio
2	2
2	2
2	3



I've worked last March 2020 in [redacted] Dirty Cage wash area for 5 weeks during the rotation period assigned to me. I was able to perform my work but been feeling a bit pain in my left shoulder and forearm and hands already. I was thinking that maybe because the workload is repetitive inside the cagewash, I might be a bit tired so I just need a rest after work. But during this month, these are the times where lots of cages and equipment's are being sent for cleaning and washing to dirty cage wash due to lots of animals are being euthanize ( due to the reason of the covid19 situation lots of research are being put on halt for a while). I was able to endured the pain on my left shoulder, forearm and hands and was doing lots of rest after work and stretches before going to work in the morning. All the while I thought the pain will fade and will lessen after working for 5 weeks inside the dirty cage wash, because cage wash staff has been given a 1 week work on site and 1 week work off site task during the phase 1 period of the covid19 pandemic. But during the work on site (for the 6 weeks I've worked on site) I was assigned in dirty cage wash for 3 weeks. And the workload during these times are overwhelming as lots of equipment's are being processed as dirty equipment's always accumulate in the dirty drop off room [redacted] and [redacted] drop off room), it was a never ending workload of dirty equipment's for cleaning and washing. And after resuming back to work during the Phase 2 period of the covid19 ( all cage wash staff now are working on site) I was assigned back again in [redacted] Dirty cage wash for 2 weeks. So all those equipment's that's been filling up by the [redacted] drop off room, it is us (Me and \* my co-worker partner inside the dirty cage wash) will be the one to process and to clear up the workload. It was an on and off/ overtime pain that I've been feeling in my left shoulder, forearm and hands (same on my right forearm and hands but not too much pain).

At ~3:45 pm, \*, an undergraduate student, was cleaning cover slips with 1 M potassium hydroxide and accidentally splashed his face with it. A small drop got into one of his eyes and some got on his face. He reported having pain in his eye when it happened. He immediately came out of the chemical room and, with the help of a graduate student \*, administered a personal eyewash. He flushed his eye for approximately 15 minutes. During this time, I was notified. I made sure he was doing OK and then checked the MSDS for the chemical to see if there was any additional first aid information (such as making sure you lift your eyelid periodically while you are flushing). After this, I walked \* to the Emergency to seek medical attention. The gave him numbing drops and flushed his eye out more. They said the abrasions were minor and should heal completely within 24-48 hours.

i was pushing wire bin full of clean cages and some stuff to the autoclave when the pain gradually develop until the end of my shift. I went home with severe back pain and couldn't come to work the next morning still suffering from back pain.

While returning a research rat back into it's home cage , it had turned around and bit me on my left index finger...

Was changing the cage of a male rat and as I placed him into his clean cage he turned and bit me on the pointer finger of my left hand. The bite is along the left side of the nail bed. He broke the glove and there was free bleeding from the site. I went and informed my supervisor at the time,\*, and then did first aid on my self cleaning the area and stopping the bleeding.

Strained right shoulder and pain.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

Exposure to Hazardous Substance Exposure to Hazardous Substance

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no	Other	no				Faculty of Medicine & Dentistry	2	3	2020 strain
			Contact with eye/n		Emergency Department	Faculty of Medicine & Dentistry	3	3	2020 eye
yes	Less than 3 days	Back				Faculty of Medicine & Dentistry	3	3	2020 strain
no		Fingers		yes	University Health Centre	Faculty of Medicine & Dentistry	2	2	2020 bite
no		Fingers		yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	2	2020 bite
yes	Less than 3 days	Other		no		Faculty of Medicine & Dentistry	3	3	2020 strain

I was trimming the imepgram off the custom tray and the scalpel slipped and cut my left thumb.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no		Hands	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2020 cut
Inflammation on right hand elbow, pain shifts from right hand shoulders to forearms. Tendinitis. A facility user in the [REDACTED] facility was observed exiting the B097 suite with improper doffing of PPE while taking samples out to put in the Central Corridor freezer. She did not remove the outer gown in the anteroom prior to exiting.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Less than 3 days	Hands	no		Faculty of Medicine & Dentistry	3	3	2020 strain
At first I was trying to push the water trolley to my area.I tried to removed cases of water from the trolley and suddenlyI felt mild pain when putting it down to the floor.I still continued doing my task and one of them is cleaning the the pig crates. Upon lifting the lid of the pig crated that started the severe pain in my back.I wasnt able to move or bend my back and having hard time walking because of the progressive pain.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition						Faculty of Medicine & Dentistry	1	2	2020
Spilled a few mls of phenol:chloroform on leg. Soaked through pants took off and rinsed thoroughly with water around 3:00 June 14, 2020. Because skin was red went to [REDACTED] emergency to get checked around 3:40. Was told was a burn but otherwise fine and released.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Unknown	Back	no		Faculty of Medicine & Dentistry	3	3	2020 strain
Cleaning Duckling pen and tweaked my back lifting things.	Exposure to Hazardous Substance Injury/Illness (Including sprains and strains)	Exposure to Hazardous Substance Injury/Illness (Including sprains and strains)					Absorption/Skin Contact	Faculty of Medicine & Dentistry	3	3	2020 chemical
Near miss. Potential exposure to tamoxifen. During a cage check an [REDACTED] staff member looked at a cage previously tagged with tamoxifen injected animals (*). The date had passed where the animals excretions were considered a risk themselves. The cage did not look completely changed out, but the Tamoxifen tag was removed. The staff notified us and we confirmed what date the lab pulled the tag. The cage was mostly changed over (new top and bottom) but the food hopper and food was not changed out so still possible to have contaminated urine on the food and hopper. We confirmed that the cage was not opened by [REDACTED] staff, so no exposure actually occurred. We addressed this with the lab staff in question.			yes	Less than 3 days	Back	no		Faculty of Medicine & Dentistry	3	3	2020 strain
During a sentinel cage change, a rat bit me through the wire-top as I was trying to remove it. I immediately flushed the area with water for 2 minutes. It bled slightly but there was no much broken skin. Cut myself on the knife holder of the microtome. I was cleaning the components of the microtome fairly aggressively to remove all the excess paraffin.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition						Faculty of Medicine & Dentistry	1	2	2020
	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Less than 3 days	Fingers	no		Faculty of Medicine & Dentistry	3	3	2020 bite
	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no		Fingers	yes	Did not receive any further medical attention	Faculty of Medicine & Dentistry	2	3	2020 cut

Description	Reported Incident Type	Actual Incident Type	Hazard(s) Exposed to	Exposure Method	Missed Time	Amount Missed	Injured Parts	First Aid	Further Attention Location	Faculty	Risk Ranking of Incident	Risk Ranking Potential	Year	Subcategory
Supervising a PDF using our groups supercritical dryer. The procedure was followed at first but due to the new "repairs" on the device it made one of the vent valves quit difficult to turn. The PDF attempted to slowly open the valve but ended up shooting it open and then was unable to close the valve on their own. I stepped in to close the valve and indicated that it is crucial for the experiment and our safety to slowly open it and not open it all the way. The PDF then shot the valve open again, I stepped in and took over the that section of the procedure. After that was finished a different valve was used to vent the CO2 gas throughout the system. Dry ice was building up on the valve and after a while the valve started to loosen and shake on its own. Luckily I noticed this and shut off the CO2 tank and released the gas slowly through a different valve. The experiment was completely shut down after this and the new valves were checked and both of them showed significant signs of loosening. The device has been shut down since and we are looking at safer options.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition								Faculty of Science	1	1	2022	
I was cleaning the removeable components of a biosafety cabinet (grills, panels, etc) late yesterday afternoon. While I was wiping a grill down with water and a paper towel to get rid of any bleach on the grill, the edge of the grill sliced into my right index finger several millimetres deep. I was wearing gloves at the time. I immediately removed the gloves and ran the finger under demineralized water for 15 minutes, washing it with hand soap several times. I covered it with numerous sterile bandages from our first aid kit.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			no		Fingers	yes	Did not receive any further medical attention	Faculty of Science	2	2	2022	cut
* is a graduate student co-supervised by myself and *. On Monday, June 27, 2022, at around 5:00 pm, he experienced a seizure while working in a research lab in E3-26. He became unconscious for several minutes and suffered bruising on his face while falling. Several research workers were nearby and accompanied him while he slowly regained consciousness, but he was still disoriented. Emergency services (911) was immediately called. They arrived promptly, assessed the situation, and took him to [REDACTED] Hospital for observation. His girlfriend (*), who was home at the time, was contacted and we suggested that she meet * at the hospital to take him home upon recovery. We were informed this morning (Tuesday) by * that * may also have injured his arm. Because * suffered a similar incident in 2021, and consistent with the "working alone" policy, * is never alone when working and generally works during normal weekday and daytime hours.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)			yes	Unknown	Head	yes	Emergency Department Hospital Admission	Faculty of Science	3	3	2022	medical

I am the PI of Chemistry's 4-269. I was personally cleaning the waste hood and found a glass bottle with a hand-written label stating "Waste HNO3 + HCl". No other information was given. The cap was not on securely, presumably to allow venting. I immediately stopped all work in this lab until we investigate and improve our waste handling procedures, refresh on labelling, and I review all SOPs ongoing in this space. I found this bottle around 11 am, June 15. Please ignore the 'incident time', below, as it keeps defaulting to 12:00 AM. The search below does not find "Chemistry" in response to question about "Select the department associated with this incident".

Near Miss or Unsafe Condition      Near Miss or Unsafe Condition

A junior lab member was tasked with putting Teflon bottles into an oven and turning it on to 150C overnight, but he did not remove the Teflon bottles from a plastic bin. Lab member left laboratory and the next morning around 8:00, I went to check on the bottles and saw the melted bins in the oven.

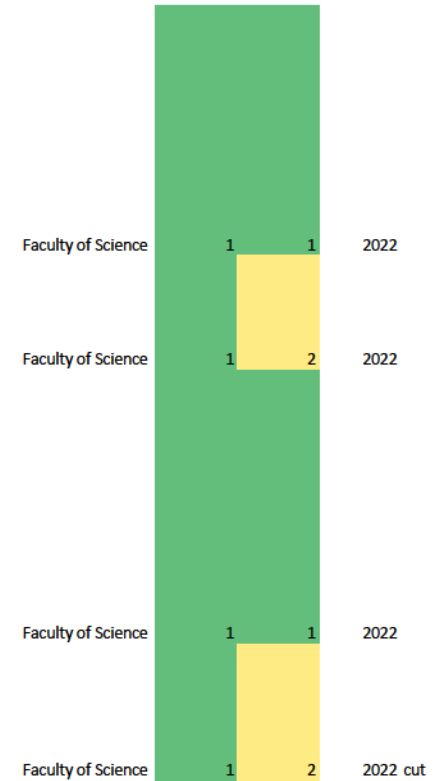
Property Damage      Property Damage

During fume hood testing we (\*, \*) entered room 4-250. We followed all posted signage regarding PPE and were aware of the hazard posed by the HF lab. We were asked to leave by a member of the \* lab group until we could speak with \* directly about lab access to room 4-250 due to the danger posed by HF. Dr. \* informed us that there was no entry permitted to his lab without his direct permission, and was disturbed that we had entered the HF lab without consulting him. After we explained our safety process he granted us access to the lab for our air flow testing. We were asked by our supervisor \* to file this report due to the unclear signage on the door about access restrictions.

Near Miss or Unsafe Condition      Near Miss or Unsafe Condition

While washing a petri dish that had been removed from an HCl acid bath and rinsed three times with distilled water, the dish slipped and shattered in the bottom of the stainless steel sink. While recovering the pieces, a shard jabbed my thumb, lightly breaking skin. I recovered the pieces and washed out the cut, which bled for a few seconds before stopping.

Near Miss or Unsafe Condition      Injury/Illness (Including sprains and strains)



At approximately 10:45 am today I was discussing with students in our group office, L2-104, when I saw \* - one of my PhD students - run towards the lab. It registered as unusual and moments later I heard water from the lab. I immediately investigated and saw him using the emergency shower. He informed me of the situation, nitric acid spill and burn, I put baking soda on his arm and foot where the burns were and I advised him to continue under the water. I went to contact \* in the departmental office but she was out. \* gave me to number to central dispatch. I called them and they contacted EHS. I went downstairs to get \*, our safety rep, and the two of us proceeded back to the lab. Meanwhile I had instructed \* to contact 911 and he did. When I returned to the lab he was on the phone with them and they were en route. I investigated the accident and here is my understanding of what happened. \* had procured a new 4L bottle of nitric acid, 70% concentration, from [redacted] Stores. He transported the bottle on a lab cart. When he arrived at the [redacted] tunnel between Phases 1 & 2, the bottle slid off the cart, hit the ground and broke. Nitric acid got on \*'s arm and into his shoe. He ran back to the lab, where he removed his clothing and got under our emergency shower. Paramedics arrived and treated him for pain and advised he continue to run water over the burns. After about 35 minutes under water they put had him walk to a stretcher and transported him out of the building. The fire department, pump #6, arrived and sent for their hazmat team, who came and decontaminated the spill site. They finished around 12:30 pm.

Exposure to Hazardous Substance  
Injury/Illness (Including sprains and strains)  
Environmental Release  
Exposure to Hazardous Substance

Absorption/Skin  
Chemical contact yes  
Unknown  
Hands Feet no

Faculty of Science

3 4

2022 chemical

When I came in at about 0830, there was water leaking into the basement of [redacted]. I went up to my labs on the fifth floor, and it was clear that the water in the basement was originating from the 6th floor and leaking all the way to the basement. According to the F&O person directing cleanup, a safety shut off valve failed on the hot water storage container on the sixth floor, just above my labs on the fifth floor. Water was pouring into my lab, presumably for very long time, flooding benches and the floor in W5-22A and W5-22B. The water caused damage to lab supplies and equipment, as well as my group members time was lost for most of the day as they cleaned or were unable to enter the lab. A side note, it would seem that F&O needs to participate in the Safety Standdown, as \* who was seemingly directing traffic for F&O, made no mention attempt at instructing clean-up workers that PPE would be needed to enter the lab to clean up. I distributed new safety glasses to those working in the lab [redacted], and when I mentioned this to \* he simply said that "I've not yet been in the Lab..."

Property Damage  
Other  
Property Damage

Faculty of Science

2 3

2022

A glass sash in one of the hoods in [redacted] 4-026 spontaneously cracked (like a windshield on a car). Building maintenance put duct tape on the sash, but it would be great if you could replace it. Thank you. The serial number for the hood is 607081. No one was hurt, but I saw the cracked sash after the weekend.

Property Damage  
Property Damage

Faculty of Science

1 1

2022

This incident occurred when I was attempting to loosen a ratchet strap under tension. Instead of a controlled disengagement, the ratchet fully released in an instant when pressure was applied to the release tab causing the tip of my finger to be pinched/cut in the mechanism. The first aid kit was immediately administered to clean and bandage the wound. The ratchet was faulty and will be disposed of to prevent further injuries.

Injury/Illness (Including sprains and strains)  
Injury/Illness (Including sprains and strains)

Did not receive any further medical attention

no  
Fingers yes

Faculty of Science

2 2

2022 pinch

The lab technician was microwave digesting a 10% nitric acid solution and the back of the instrument disconnected from the vent since it had been secured with duct tape and started to vent into the lab, it was caught quickly and fixed, with no injury to staff or the lab. A metal stir plate was missing the ground plug and it was still being used by staff.

Exposure to Hazardous Substance  
 Exposure to Hazardous Substance  
 Chemical  
 no  
 Near Miss or Unsafe Condition  
 Near Miss or Unsafe Condition

Sink that contained "drosophila discards" overflowed and flooded the floor. This was due to a leaky sink faucet. The vials had been autoclaved before soaking so the fruit flies were dead and any fungus or bacteria was dead. The media in the vials was composed of molasses, cornmeal, dry yeast and agar. There is no chemical or biohazard.

Other  
 Near Miss or Unsafe Condition

Chemical Spill. Dr. \* (retired veterinarian working with [redacted] [redacted] was transporting a plastic bottle (within a plastic bag) of ~3% formalin to the [redacted] unit. He tripped while walking up the stairs at the [redacted] North entrance of the [redacted]. The bottle dropped and cracked, leaking preservative onto the flagstone floor and rubber-backed carpet. Using gloves, paper towels and plastic bags he had on hand, Dr. \* wiped up the floor and back of carpet and bagged all waste materials. This was deposited at the Microscopy unit with \* (\* Manager). She notified the Safety Officer of the incident. Safety Officer immediately notified HSE by email; they advised to collect and contain carpet and mop floor area with soap and water. (Safety Officer had PPE - buttoned lab coat, long pants, closed toe shoes, half respirator with multi acid gas/organic vapor cartridges, safety goggles and 2 pairs of nitrile gloves). Carpet rolled and contained in garbage bags (taped each end and bagged and taped again). Material stored outside (as per HSE instructions) - located underneath metal ramp at west loading dock area of [redacted] Building (is out of sight). Floor mopped 3X with soap and water as per HSE instructions.

Other  
 Property Damage

Fume hoods unexpectedly shut off. \* discovered the fume hood in 3-01D was not operational around 4:00pm. Control Centre was called and mechanics were dispatched. Other fume hoods on the line were also not functional. The breaker on the exhaust fan broke and was fixed by an electrician.

Near Miss or Unsafe Condition  
 Near Miss or Unsafe Condition

Faculty of Science	1	3	2022 chemical
Faculty of Science	1	4	2022
Faculty of Science	1	2	2022
Faculty of Science	1	1	2022
Faculty of Science	1	2	2022

Glassblowing hand torch fault, and resulting oxygen supply hose fire. I had just replaced the hand torch that I had been using with another from the stock of torches because of a worn gas valve. A worn valve generally isn't an issue, but it does reduce your control over the flame somewhat. Most of the torches in the shop are fairly old and all 3 I've used have had valve issues. I found that the most recent torch I installed (at about 15:00) had a similarly worn valve, but it didn't impede my work so I carried on because a mild-to-moderately worn valve does not usually present a safety concern. While I was working (at about 15:30), I adjusted the flame and the slop in the valve caused the torch to flash back (the flame traveled back into the mixing chamber of the torch and it extinguished itself with a "pop" noise). This also generally isn't an issue and happens with some regularity, especially while doing detailed work with a small flame. For some reason, this time when I went to clear the torch (turn off the gas valve and open the oxygen to blow out any residual burning gases) an unusually loud "pop" occurred and the oxygen supply line caught fire and burned uncontrollably. Most of the flame came from the oxygen supply causing the PVC hose to burn. I immediately turned off both gases at the workbench supply valves and the flames smoldered, then self-extinguished. Once it was safe to handle, I placed the torch and hoses in a fire-proof container. There were no injuries and minimal damage to property (scorch marks on the floor). The cause seems to have been a fault within the torch itself.

Labs on 4th floor of the [REDACTED] (W4-22) were broken into and a number of items stolen, including various electronics, and laptops

I was removing a drill bit from the drill chuck with the key. My hand slipped from the key and landed on the vice causing my finger to bleed around the nail.

Near Miss or Unsafe Condition    Near Miss or Unsafe Condition

Other    Property Damage

Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)

no

Fingers

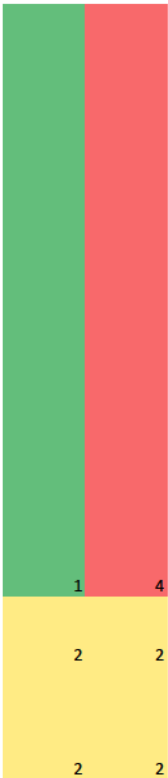
yes

Did not receive any further medical attention

Faculty of Science

Faculty of Science

Faculty of Science



2022

2022

2022 cut

At about 10 AM today (March 29th), an employee notified me that he saw several boxes filled with various chemicals in the north, basement stairwell. I went down to the stairwell to confirm that there were approximately 15 boxes filled with numerous dusty, bottles and vials of experimental and commercial chemicals. Looking at some of the vials, I noticed some were dated from about 1971 to the mid-1980s. Many of the vials had faded or degraded labels, while others were not labeled at all. I inquired with staff working in the basement and no one knew anything about the chemicals left in the stairwell. I then sent an email to the Department to notify everyone of the incident and to reinforce that there is a defined process for disposing of unwanted chemicals and people should not be afraid to ask. After sending the email message, I went back downstairs to talk to the Stores Supervisor, \*, to obtain his assistance in moving the chemicals out of the stairwell and into a teaching lab so that we can determine how to dispose of the chemicals. That is when Dr. \* came down the hall, approached me, and apologetically admitted that he had left the chemicals in the stairwell last evening (they were moved from the basement of his home). I advised him not to worry and that we would help him with disposing of the chemicals safely. At about 11:30 to 12 noon, \* contacted me to advise that Dr. \* had called her regarding the chemicals he brought into the Chemistry building and inquiring how he could dispose of them. I am now working with \* to determine how we can dispose of the chemicals.

Incident Description	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition	Chemical	Exposure	Medical Attention	Location	Count	Year
	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition				Faculty of Science	1	2022
Cut finger on cured epoxy resin when removing modelling clay moulding barrier.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)		Hands	yes	Faculty of Science	2	2022 cut
Student poked himself rather hard with a sharp awl when cleaning specimen.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)		Hands	yes	University Health Centre	3	2022 cut
Researcher (* discovered broken glass on the floor of a greenhouse room (CW653) in the Building. As well, a pane of glass in the ceiling area was observed to be loose. Safety Officer was notified. Information was passed on to Dept. Chair, Dept. Manager and unit. F&O also contacted (*). Emergency personnel (*) cleaned up broken glass and temporarily secured loose pane of glass. F&O work order to repair/secure glass panes has been filed. Dept. wide email message sent out advising users of hazard and recommending avoidance until repairs effected.	Near Miss or Unsafe Condition	Property Damage				Faculty of Science	1	2022
At around 10:30 am this morning, I was using the rotavapor for condensation. I forgot to refill very much dry ice for cooling when I was doing the removal of solvent. Unfortunately, this mixture contains dangerous trichloroacetonitrile that caused this incident because it lead to the leak of trichloroacetonitrile gas into the lab. Soon *(*) felt eyes burn, then we left the lab immediately and did a quick wash for hands, face and eyes. Later, I locked the door and put a maker on the door to stop someone getting into the lab. Then we went home for a long shower. Now, we are feeling ok. Re: INC00001446	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chem Inhalation		no	Faculty of Science	1	2022 chemical



During the Mar 15th AM Micro 265 lab, * leaned over her bunsen burner to point to a flask on the front bench. * had her long hair in a low ponytail, and some of it shifted forward in front of the bunsen burner, catching fire. She was able to put out the fire quickly through physical motion. Approximately 2-3" was singed on the left side of her hair. Her TA, *, brought her into the student coat room to assess the damage and support her in private, before * tied her hair into a bun, and went back into the lab to rejoin her partner and complete the session. Luckily, * was not burned anywhere else except her hair.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Other	no	Faculty of Science	1	3	2022 burn	
While completing an experiment in 107 lab room (CW 110), the student touched/rubbed her eye after handling a pipette with Iodine and NaCl2 (Salt).	Other	Exposure to Hazardous Substance				Faculty of Science	1	2	2022 chemical	
When using a hot plate, the wire made contact with the surface of the hot plate causing it to melt through the rubber coating of the wire and exposing it. There was a tiny spark that was caused during this process	Property Damage Near Miss or Unsafe Condition	Property Damage				Faculty of Science	1	4	2022	
1 243 student (*) was packing cotton wool into a disposable glass pipet to create a filter. A longer pipet was used to perform the packing. The student broke the longer pipet and it stabbed her finger, possibly breaking off with small pieces of glass within. First aid was administered by me (*) and Campus Protective Services was called to facilitate transportation of the student to Emergency to be assessed by a physician.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Unknown	Fingers	yes	Emergency Department	3	3	2022 cut
The wire of the hot plate made contact with the hot plate itself. The rubber coating melted and the wire was exposed	Property Damage Near Miss or Unsafe Condition	Property Damage				Faculty of Science	1	4	2022	
I was in my 460 lab and I was capping a needle that had been used to dispense DMSO-d6 and I pricked my finger. I put my finger under water, washed it with an alcohol wipe and put a bandaid on.	Exposure to Hazardous Substance	Injury/Illness (Including sprains and strains)		Cut/Laceration/Puncture/Needle/Chemical stick		Faculty of Science	2	2	2022 needlestick	
On November 2nd 2021, I noticed a cardboard biohazard waste box and a yellow biohazard waste pail in the publicly accessible hallway outside of research lab L2-053 in . I contacted the professor in charge to let them know about this so they could contact their students and make sure biohazard waste was not left unattended and unsecured. On February 18th, 2022, I saw another biohazard box and pail left outside the door to this lab again. I believe they are stored there while awaiting pickup, but my understanding of University regulations is that hazardous waste cannot be left in an unsecured area for any amount of time. I have pictures available of both incidents if necessary.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition				Faculty of Science	1	3	2022	
A study subject (Black Capped Chickadee) bit me on the hands while I was handling it for research purposes. It broke the skin while biting but the cuts are tiny and shallow. I washed my hands afterwards.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	Hands	no	Faculty of Science	2	2	2022 bite

An undergraduate student, \* was at her lab bench when she cried out and fell backwards to the floor having a seizure. The TA (\*) remained with the student while I (\*) went to call 911. The tonic portion of the seizure lasted about two minutes, she was foaming at the mouth and her nose was bleeding. Then the student relaxed and when she first regained consciousness she was very confused. She said she has not had a seizure before. She also had not had anything to eat in the last 24 hours. Only water and her antidepressants. We asked if there was anyone we should call and she said no. When the ambulance arrived \* was lucid, they took her to the hospital around 4:40 PM. Other witness was a student \*.

Injury/Illness  
(Including sprains  
and strains)

Injury/Illness  
(Including sprains  
and strains)

no

Head  
Other  
yes

Faculty of Science

3

3

2022 medical

I have noticed that since the new cleaning crew took place, no cleaning at the heavy-lab's toshiba area is taking place. With the demand for different types of jobs to be run on the toshiba machine, spills from cutting fluid to the area around the machine are dangerous and without cleaning it gets slippery, even the floor is getting dark/dirty now. I just slipped with no critical accident but a solution needs to be found for this issue. I don't mind starting doing housekeeping but I would need to have cleaning products ready.

Near Miss or Unsafe  
Condition

Near Miss or Unsafe  
Condition

Faculty of Science

1

3

2022

For the ; 297 undergraduate lab, one of my responsibilities as a TA is to dispense liquid nitrogen to students from a small dewar so they can experiment with superconductivity. This dewar is filled by the undergrad lab technician prior to the lab and stored in a bucket on the floor with a rubber stopper placed in the opening to prevent evaporation. Today when I went to lift the dewar to dispense the nitrogen, nitrogen boiled over from the dewar very dramatically. This resulted in what seemed like a fairly significant volume of nitrogen landing on me (it mostly landed on my legs, some also got on my arms). I don't believe any got trapped underneath the fabric of my clothes, as far as I can tell I have no burns from the experience. No students were affected, all were standing sufficiently far from the dewar so none of the expulsion reached them. After the fact, it appears that the mouth of the dewar had iced up, which likely led to an increase of pressure inside the dewar such that the small movement it experienced as I lifted it caused boiling with enough pressure to push the stopper off and expel nitrogen.

Near Miss or Unsafe  
Condition

Near Miss or Unsafe  
Condition

Faculty of Science

1

3

2022

At 13:36 a grad student noticed 3-01D was at a temperature below 15 C and that the cold air was coming from a fume hood with a positive draw. They contacted Control Centre. Control Centre confirmed that the air supply to that the fume hood been shut off for maintenance work and that time turned it back on. There had been no notice from F&O about a shut down. F&O and Control Centre confirmed that air supply unit 1 and 2 had been turned off from 9am - 2pm. This would affect all the fume hoods in except those in 4-01. Anyone working those labs were at risk of exposure of any hazardous materials open in those fume hoods. It is likely that the clean room in 4-14 was contaminated leading to possible property loss/damage. There were no open chemicals in the fume hood of 3-01D, so that incident was a near-miss for the student working in there.

Property Damage  
Exposure to  
Hazardous  
Substance

Near Miss or Unsafe  
Condition

Near Miss or Unsafe  
Condition

Chem  
Inhal  
ation

no

Faculty of Science

1

3

2022

■■■■ cut herself on a microtome blade. She had been sectioning on the microtome, and walked away to another room to get more samples. She thought she had engaged the safety mechanisms (a wheel lock and a blade cover) before walking away, but actually she forgot to. When she sat down again she reached out to change the sample and the sample holder moved since the wheel wasn't locked, and her fingers hit the uncovered blade below. She immediately applied paper towel to slow the bleeding, then ran her fingers under water to assess the situation. We determined she had at least one bad cut and she needed to go to the University Health Centre to get it checked out. She got the bleeding under control by applied pressure, then we walked over to ■■■■ together. I waited with her until she was admitted. She later came back to the lab and told me she got four stitches, 2 on her middle finger and 2 on her thumb. She said she was doing fine at that time.

Injury/Illness  
(Including sprains  
and strains)

Injury/Illness  
(Including sprains  
and strains)

no

Fingers

no

Faculty of Science

3

3

2022 cut

My student \* was working in the tissue culture room shared by the \* Lab and the \* Lab (■■■■ 156) on Sat, Jan 08 2022 and steadily smelt an odour similar to that of a pool. The odour was very faint in the tissue culture room. However, when he left the room to go to the washroom, he walked past the ■■■■ lab (■■■■ 5-149) around 1:30 PM, where there was a strong smell of chlorine. He then got another member of the \* lab (\*), who validated the caustic smell, after which they both left the building immediately and went outside ■■■■ for fresh air. They both immediately contacted Dr.\* and called protective services who connected them to building services who came to investigate according to the Dr. \*. \* started feeling extremely light headed when he left the building which subsided after exiting the building, however, after which, he took a long shower and started to relax and then started exhibiting chest pain around 2 hours or so after the incident and went promptly to the ER. The Dr. at the ER described his symptoms as relating to acute chlorine gas exposure. He is fine now and checked out fine from the hospital.

Exposure to  
Hazardous  
Substance  
Environmental  
Release  
Near Miss or Unsafe  
Condition

Exposure to  
Hazardous  
Substance

Chem Inhal  
ical ation

no

Faculty of Science

3

3

2022 chemical

We had a break and enter and theft of laboratory chemicals from CW 322 sometime between the evening of Dec 29, and morning of Dec 30. They took chemicals from the dessicator in that room, and several jars of chemicals from the chemical cabinet. The door into adjoining room CW320 was found unlocked by Campus security when they assessed the scene. This door was unlocked for work conducted in there by our construction shop. It is a tricky lock to close properly. Missing from dessicator; chloramphenicol and phenylmethylsulphonyl fluoride. From the shelves boric acid, citric acid, anhydrous ca sulfate, glucose, arabinose and a bottle of glycerol are missing

Other

Property Damage

Faculty of Science

2

2

2021

I Scraped my right thumb on the knuckle from an air filter pulling it out of the box.

Injury/Illness  
(Including sprains  
and strains)

Injury/Illness  
(Including sprains  
and strains)

no

Hands

yes

Did not receive  
any further  
medical  
attention

Faculty of Science

2

2

2021 cut

This incident was caused to me from Jordan Cameron one of the typical machinists. We had a near-miss incident in the teach shop this morning that I need to report. This morning a student approached me to give them a quick refresher on the Leinen lathe. As I walked to the lathe I noticed that although a chuck was on the machine, the hand-wheel to tighten collets (when the chuck is removed) was still in the machine as well. When I got to the lathe I pulled on the hand-wheel and to my surprise it came out of the machine without any effort. This means that the hand-wheel was not being held in the machine and could have become a projectile whenever the lathe was spinning. I proceeded to show the student which levers adjust various functions of the lathe. I then turned on the spindle; surprisingly the chuck shifted positions as it threaded itself further onto the drive spindle. I quickly turned off the spindle. I decided to teach the student on a different lathe so I could have time to discover what happened on the Leinen lathe. Upon investigation I discovered that the chuck was improperly installed on the Leinen lathe. All of the chucks for the Leinen lathe have a set of toe-hooks that clamp into a groove and provide a secondary measure ensuring the chuck cannot come off when the machine is spinning. The proper procedure to install a Leinen chuck is to take off the toe-hooks, screw the chuck onto the lathe's drive spindle, then put the toe-hook back onto the chuck. This time the chuck was threaded onto the drive spindle without removing the toe-hooks first. Instead of the toe-hooks providing a secondary measure of safety, they were actually blocking the chuck from being correctly installed. The chuck was not properly seated into the drive spindle face. The chuck had the ability of tightening or loosening whenever the spindle was turned on. Which is what was witnessed this morning - the chuck tightened slightly onto the drive spindle when I turned on the lathe. I

Near Miss or Unsafe Condition Near Miss or Unsafe Condition

Faculty of Science 1 3 2021

A worker was cleaning 2-239 inside [redacted] when the worker went to take out the garbage they inadvertently knocked over a glass chemical bottle that was on the floor causing it to break and the chemical to leak onto the floor. The worker immediately informed their supervisor who assessed the situation, blocked it off, and donned the appropriate PPE in order to clean up the chemical. We are in the preliminary stages of our investigation and are unable to provide specific details at this time. We will update when we get more information.

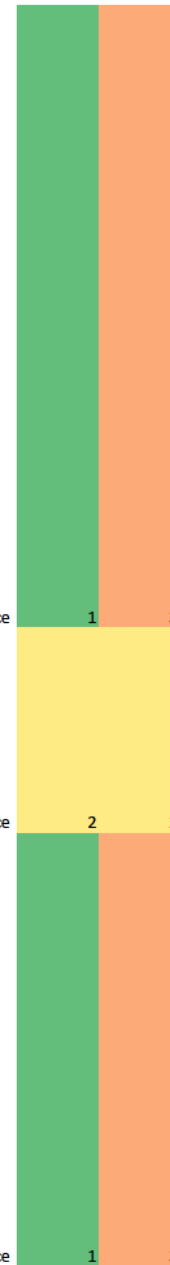
Property Damage Exposure to Hazardous Substance Environmental Release Environmental Release Other no

Faculty of Science 2 2 2021

Reflected laser light I was working with a colleague to assemble optical components for a laser beam at 780 nm that was split into two using an acousto-optical device. I was using a [redacted] power meter to measure the optical intensity of the beams, to assess how bright they were. These are routine measurements in our lab. Our power meter head typically has a matte surface that the beam hit. Someone else had changed our power meter head to an identical one, but that had a reflective surface. I had never used this type of power meter head and didn't realize it was so reflective (why would you make it reflective?). As I inserted the power meter head into the beams, it reflected and entered the left eye of my colleague. She said she saw the light for a very short time interval. The laser power of both beams together was about 77 mW. Using a second power meter we measured the power of the \*reflected\* beams and found that together they had a power of about 3 mW, 1.5 mW in each beam. Given that the reflected power was relatively small, we don't expect any eye damage to have occurred. Neither of us was wearing safety goggles.

Near Miss or Unsafe Condition Near Miss or Unsafe Condition

Faculty of Science 1 3 2021



At around 0800 23Nov2021 the rooftop airhandling HVAC unit in cleanroom [redacted] went off. I had stepped out of the lab around 0755 to get a coffee, and returned about 0810 to find all the air alarms sounding indicating HVAC off. I immediately called Controls from the entryway of [redacted] as the room is centrally monitored, and was advised that Controls had shut the HVAC unit off for a scheduled filter change (which occurs every 6 weeks or so, always with an email notification). I received no prior email regarding this shutdown, and advised controls of this. I advised them to contact the people replacing the filters and ask to have it done as quickly as possible as open acid was present in normally-vented clean hoods. I was mid-way through processing geological samples for analysis, and had acid solutions open in normally-vented clean-air hoods, which would no longer be vented when the air went off. These solutions comprised ~ 24 ml dilute (0.2N) nitric acid, and ~ 18 ml concentrated hydrobromic acid. I returned to [redacted] at ~ 0840 and the HVAC air handing system was on. I waiting 15 minutes for sufficient air exchange to occur in the lab then continued work.

Biohazardous materials being stored in [redacted] G-116. Room not registered i

Near Miss or Unsafe Condition    Near Miss or Unsafe Condition  
 Near Miss or Unsafe Condition    Near Miss or Unsafe Condition

A small fire started in a beaker containing several grams of lithium aluminum hydride inside a fume hood. The fire was extinguished with the lab fire extinguisher. No damage or injury occurred. I assume that the material was exposed to atmospheric moisture. The flames were never more than 2 or 3 inches high. This happened several weeks ago and I forgot to submit a report. The times and dates given below are approximate. The incident happened at \* lab . I was standing on a stool that had wheels when trying to close the lever above the sink the stool slipped(did not realize the wheels did not retract) and I fell hand first into the sink, spraining two fingers.

Other    Property Damage  
 Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)

no    Hands    no

Received a phone call from lab that there was a fire incident. A fire had started. Students (\* and \*) were grabbing paper towel while using the bunsen burner. The paper towel we received from the manufacturer had not been cut properly and therefore all the pieces came out when the student pulled the one piece (like an accordion). The paper towel in the middle of the accordion lit on fire as it passed over the bunsen burner. The students called the TA (\*) over, who pushed the paper towel that was on fire onto the floor and stamped on it. \* had slightly burned his hand during this event (the webbing between thumb and index of his left hand). It appeared slightly pink. I advised \* to run his hand under cold water for at least 10 minutes, which he did, while I got him some ice. \* said he was ok. The students were not hurt. I will be contacting the paper towel manufacturer and moving all paper towels either off benches, or (when possible) in the middle of benches where no students are seated.

Injury/Illness (Including sprains and strains)    Injury/Illness (Including sprains and strains)

no    Hands    yes    Did not receive any further medical attention

Faculty of Science	1	2	2021
Faculty of Science	1	1	2021
Faculty of Science	1	3	2021
Faculty of Science	2	4	2021 fall
Faculty of Science	2	3	2021 burn

Student was working in the [redacted] 207 student lab. We were working with the antibiotic ampicillin. The antibiotic is in some of the medium we use and in two liquid cultures. We notify the students of this use of this antibiotic by signing the door, by sending out a lab coordinator announcement the week before and the TAs review the use of the antibiotic and the measures the students can take if they think they are allergic (ultimately the choice of action is the student's). The student went to take the plates on the side bench and condensation from the plate (from under the lid) got onto their hand. This was all before she was able to put on gloves. The student washed their hands immediately, however, the students hands became very red. When the redness went away, she put on gloves. Then the student noticed that their hands became swollen, their heart started to beat quickly, had trouble breathing, and had a hard time concentrating on what the TA was saying. Student was brought down to the prep room (G104) for the labs by the TA. The techs got the student to sit on a chair until they started to feel better. The techs called an acquaintance (the students boy friend) to come and pick them up. The strongly suggested that the student see a Dr. The techs walked the student to their ride.

Exposure to Hazardous Substance  
 Exposure to Hazardous Substance  
 Absorption /Skin Chemical Contact

no

Faculty of Science

3

3

2021 chemical

During the morning lab (~10:20 am) on Tues, Nov. 2nd, I received a phone call from one of my TAs (\*) in the [redacted] 265 lab (BS M245). A student had been burned. I have first aid so went to check on the student. The was student: \* (CCID \*) She said she had run her hand under cold water for several minutes and then went back to do benchwork. I recommended she run her hand under cold water for ~ 10 min, but she was very adamant about getting back to work. I got some ice in a plastic bac wrapped in paper towel and let the student know to hold the ice on the burn for 15 minutes. The tip of the middle finger on the left hand was blistered. The burn was ~ 0.5 cm long and 0.5 cm wide. I asked \* how this happened and she informed me that while she was sterilizing the lip of the tube with a bunsen burner flame (performing proper microbiology aseptic technique), she thought the tube had cooled enough to be grabbed, but it was still very hot from flaming. I also asked if she wanted me to escort her to the medi center (she said no and just wanted to stay in the lab). This is the second incident with the same student, performing the same technique. I will send a follow up email to \* tomorrow, and in this email remind her to grab the tube at a lower location, not the flamed location.

Injury/Illness (Including sprains and strains)  
 Injury/Illness (Including sprains and strains)

no

Fingers

yes

Did not receive any further medical attention

Faculty of Science

2

3

2021 burn

Chem Lab 261 with \* My left eye was burning and it was uncomfortable. I don't know what got into my eye. I didn't splash anything, we were working on the industrial contamination incident and were working with strong bases and acids for the experiment. After washing my eyes it felt a lot better.

Exposure to Hazardous Substance  
 Exposure to Hazardous Substance  
 Other

Contact with eye/nose/mouth Chemical Contact with eye/nose/mouth

yes

Did not receive any further medical attention

Faculty of Science

2

3

2021 eye

A couple of splashes of the unknown sample mixture from the [redacted] 261 Experiment 4 splashed underneath my eye goggles and potentially landed into my right eye. I washed my eye out at the eye wash station and have not felt irritation at all.

Exposure to Hazardous Substance  
 Exposure to Hazardous Substance

Contact with eye/nose/mouth Chemical Contact with eye/nose/mouth

no

Faculty of Science

1

3

2021 eye

I was performing an experiment in my 361 Lab and we were using heating mantles. My heating mantle was too large for the round bottom flask so some sand had to be added. Once my experiment was nearing the end, I turned the heating mantle off and lowered the mantle. Not too long later I was going to move the mantle and it was still too hot so I dropped it and the hot sand spilled out in the fume hood. As I was moving my hand away from touching the hot mantle I ended up hitting the hot spilled sand with the side of my left hand and burning the two outer fingers all along the sides.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Science	2	3	2021 burn
In the 265 lab (BS M245) yesterday (Oct. 5th, 2021 ~ 3:30 PM sections D09, D10, D11, and D12) a student was using a bunsen burner at a communal station. After igniting the bunsen burner with a match the student placed the match down on bench liner. The bench liner caught fire. A TA (D*) saw and doused the fire with dH2O. No one was hurt. We provide beakers to place matches at each station (the student may not have seen it or it may have been moved by another student). We have since removed the bench liner from the workstation. We are also looking into replacing the matches with strikers.	Other	Near Miss or Unsafe Condition					Faculty of Science	1	2	2021
During the morning lab (~9:45 am) on Tues, Oct. 4th, I received a phone call from one of my TAs (*) in the 265 lab. A student had been burned. I have first aid so went to check on the student. The student: (CCID *) was running her hand under cold water. She had been running it under cold water for several minutes. I got some ice in a plastic bac wrapped in paper towel and let the student know to hold the ice on the burn for 15 minutes. The skin looked tender and upraised slightly, as well as quite red. The burn was ~ 1.5 cm long and 0.5 cm wide. I asked * how this happened and she informed me that while she was sterilizing the lip of the tube with a bunsen burnder flame (performing proper microbiology aseptic technique), she didn't realize how hot the tube would be and then grabbed the tube where it was still very hot from flaming.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Science	2	3	2021 burn
A student (*) during a physics lab in L2-154 received a minor papercut. Her TA came to me and I supplied a band aid. No further assistance was needed.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Science	2	2	2021 cut
I, the student work in the Physics Laboratories at the [redacted] at the [redacted]. Part of my job involves lifting heavy plastic bars and carrying them from one room to the other. I also have to stand up for long periods of time (5 hours per session, about 2 sesions a week) polishing and wrapping those plastic bars in special material. By doing this, over time, I ruptured a wound I have on my abdomen from a surgery that took place in December of 2020. Because of this rupture, caused by my work in the lab, now I have an incisional hernia at the site. The pain started on Monday, Sep. 27th, 2021 and I visited the doctor (at the Health Centre, Dr. *) on Tuesday Sep. 28th, 2021. The doctor determined that I have an incisional hernia. I informed my supervisor about the problem, today, Sep. 29th, 2021.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	Unknown	Other	no	Faculty of Science	3	3	2021 medical
after I left the lab and was putting away my things to leave, I cut myself on something (either from a paper cut or sharp pencil). I then went to my chemistry lab TA who was the closest one around me who could give me a bandaid.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Hands	yes	Did not receive any further medical attention	Faculty of Science	2	2	2021 cut

Accidentally grabbed the unplugged hot plate and it was still hot. I got wrist and thumb pain in both hands since I did many times pipetting (right hand) and opening and closing tubes for MGT optimization experiments etc. (left hand). and use the computer to handle the HPLC to detect samples and analysis the HPLC experiment date by the right hand also.	Other	Injury/Illness (Including sprains and strains)							Faculty of Science	2	3	2021 burn
While unpacking a shipment of samples, a small piece of dry ice got inside the right hand glove unnoticed. Once it began to hurt, the glove was removed and it was discovered that the piece of dry ice had caused a 0.5 cm diameter surface burn where the hand meets the wrist near the thumb.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	yes	More than 10 days	Fingers	Hands	no		Faculty of Science	3	3	2021 strain
	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no		Hands		yes	Did not receive any further medical attention	Faculty of Science	2	2	2021 burn
HSE on call person, *, received a phone call from the Control Center about the leak of liquid from the experimental set up area within the fume hood in W4-14, █ Building. The Control Center person noted he contacted the lab supervisor and obtained two other contact numbers for the lab. He also mentioned the Building personnel wants to know what the liquid is before stopping the leak. At the time the leak was limited to the room and the adjacent office space. * advised the two contacts should be contacted first as they would have a better idea what the liquid is and this advice was followed. * contacted Control Center to check the outcome. The lab emergency contact, Dr. * who appears to be the PI for the space, confirmed that the liquid is water and advised the lab is safe to enter. Building services stopped the slow flowing leak and the █ team was called to complete the cleaning. The area affected, apart from W4-14, are two adjacent rooms W4-14B and W4-22. * advised Control center that it is a good idea to let * group know about the incident in case she decides to send an assessor on the scene. Control center person believes the flood is not significant so can be considered minor.	Other	Property Damage							Faculty of Science	1	2	2021
I spent pretty much the whole day putting components back into this equipment in the heavy-lab L2-247. The lab was pretty hot and I did sweat a lot that day. So, before I went home, I decided to take a shower at work L2-224. When the water started to run over from the shower area, I did slide right away and fell sideways right on my left shoulder/arm. I couldn't move my arm at all and had a lot of pain. I went home and applied ice/voltaren and rested. On the next day, I decided to wait a few days to see if I would see any improvement. Today after 4/5 days, the improvement is minor and I'm thinking of going to see a doctor.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no		Other		no		Faculty of Science	3	3	2021 fall
Found gas smell in lab on July 28, 8am, and proceeded to check all gas valves, until I found one open, and then I closed it. I then called emergency services and was instructed to pull the fire alarm.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition					no	Chemical	Faculty of Science	1	4	2021
A radiator coil control valve split on the 5th floor in Room 579. The flood was from the 5th floor down to the basement of █ The water was isolated and cleaned up on July 17th, and the restoration contractor started the drying process the same day. Before the damaged drywall could be cut out an asbestos abatement was needed. MSS and CS were both affected by the flood: (MSS) 579, 581, 583, 577, 481, 479, 476, 475 (CS) 379	Property Damage	Property Damage							Faculty of Science	3	3	2021



A radiator line ruptured in █ 607 causing water to spray out and flood the Southern side of █ from the 6th floor to the basement, including an elevator shaft and stairwell. The line break was isolated and water was cleaned up. The restoration contractor was onsite for final extraction and drying. MSS and CS were both affected by the flood, including rooms: MSS: 605, 607, 611, 505, 509, 511, 405, 409, 415A, CS: 313

Property Damage Property Damage

Faculty of Science

3 3

2021

A flood occurred in the East Tile on █ L2. A DI line under a sink in L2-008B ruptured causing water to flood the lab and move through the drywall into other spaces. A list of affected areas are: L2-003, L2-007, L2-008, L2-008B, L2-010, L2-015, L2-069, the hallways, Stairwell #1. Water was isolated and cleaned up by building services. The rubber baseboards were removed and holes were drilled into the walls to vent and dry them. The restoration contractor was on site to do final extraction and drying the same day. Physics was affected by the flood

Property Damage Property Damage

Faculty of Science

3 3

2021

█ stock tank matured and became territoriality aggressive. Attempts to remove defensible breeding spots were not sufficient to curb aggression. Eventually, all males had to be moved to separate holding tanks. Females held in refuge tanks continued to aggress, and had to be separated as well. Deaths were approximately one fish per day for the first two weeks of the incident. Mortalities mounted in the third week as fish moved out to hospital and refuge tanks failed to recover. About one week into the incident, the fish were split over two large housing tanks, both tanks continued to show the same effect. One breeding pair guarding new offspring were left in the second holding tank. No specific breeding pairs were found in the initial tank, but at least three large healthy males in breeding state were taken from that tank. Of the 115 juveniles, there remain 20 adults. Expected mortality for juveniles of the age these were when acquired is at the rate of full adults. In other words, just over 80% of the fish were lost over a span of six weeks. There were no mortalities in the lab during this period (June 7 to July 13) other than the fish from this cohort. Several tanks in the lab have held juveniles as they matured at densities similar to these for years without such problems. Differences with this shipment of fish that may have led to this include: 1) These fish may have been more wild-type than those in the lab, and been more prone to maturing quickly and fighting for territory in crowded conditions. 2) The temperature in the main room, where this tank was, is a bit warmer than the other holding rooms containing maturing cohorts. Low temperatures in the lab in winter can bring the fish out of breeding state. We turned off the heaters this Summer, but could not get temperatures below breeding state. 3) The large holding tank density may have effectively been too large to prevent breeding. The other cohort tanks in

Other Property Damage

Faculty of Science

2 2

2021

While changing rat cages I used my left hand to grab a palmful of feed pellets to toss into the next cage. While scooping the handful of food I turned around to count the cages on the shelf. While counting the cages I was distracted and left my hand resting in the wire barred feed hopper on top of the rat cage. I felt a sharp pinch and jerked my hand backwards. The tip of my left thumb was stinging and tender. Glove was not broken through but I suspected the bite had broken the skin. Later once I removed my gloves and the wound dried I could see the 2 small red lines were the teeth had slightly broken the skin.

Injury/Illness (Including sprains and strains) Injury/Illness (Including sprains and strains)

no

Fingers yes

Did not receive any further medical attention

Faculty of Science

2 2

2021 bite

Teflon-lined foil was accidentally furnace at a temperature of 560C in our lab at █ 2250 the morning of Thurs July 15. Above 300C, teflon releases toxic fumes, and as such our lab (and hallway) has a distinctive burning smell.

Exposure to Hazardous Substance Exposure to Hazardous Substance

Chem Inhal ical ation

no

Faculty of Science

1 3

2021 chemical

Physical interaction between two staff members: \* (Lab Tech) and \* (Sr. Lab Tech). \* claims she was pushed and prevented from leaving the workspace. Matter was immediately adjudicated by Faculty of Science HR and the support staff union, [REDACTED]. The incident is being reported in July 2021 as \* has taken/is taking medical leave (June - August) which relates back to this event, and is being considered as a WCB case (reports submitted and pending review).

Other

Near Miss or Unsafe Condition

Faculty of Science

1

3

2021

I was working in the lab alone at that moment and trying to connect a glass joint to a piece of rubber tubing. The glass joint snapped and cut the back of my thumb, close to the hand. I took out my safety glove, washed the wound and realized that it was deep and was bleeding more than normal cuts. I tried to put a band aide over it, but was unable to, so I applied pressure using a paper towel. When I started to feel bad, I texted a coworker, who I knew was close by, asking for help and exited the lab to also look for someone that could help me. I found a researcher close by but started to feel like I was going to faint, so I sat down and asked her to call emergency. Within ~2 min my other colleague arrived (who I had texted) and within ~5 min two peace officers arrived to respond to the emergency call. They tried to stop the bleeding by wrapping my hand in gauze, but it seemed to not be very effective. So one of the peace officers assisted me and drove me to the [REDACTED] clinic to get treatment. At that point I had been applying pressure to the wound and I was feeling much better. They gave me 3 stitches, a tetanus shot, and told me I was good to go back to work.

Injury/Illness (Including sprains and strains)

Injury/Illness (Including sprains and strains)

no

Hands

yes

University Health Centre

Faculty of Science

3

3

2021 cut

On July 05, 2021, I discovered that a biosafety cabinet had been moved from W5-04 Chemistry to E4-14 of the same building. The biosafety cabinet had not been decontaminated before being moved nor tested in its new location. Dr. \*'s group, who received the cabinet, have been using the cabinet for some time. The cabinet came from the lab of Dr. \*. I received confirmation from \*, a technician for Dr. \*, that the cabinet was never used by their group but was used by Dr. \*. \* has also confirmed that the cabinet was used extensively by Dr. \* before being moved. I was able to test the cabinet on 06 July 2021. It passed the test.

Near Miss or Unsafe Condition

Near Miss or Unsafe Condition

Faculty of Science

1

1

2021

[REDACTED] worker requested chemistry staff member (me) to open door to room WB-29 in the [REDACTED] building basement on ~ June 29th or 30th (?) afternoon ~3:30pm. Worker did not have keys to the room, but had been asked by their supervisor to "Clean up mess on floor". The person removed their mask to speak. As requested I opened the door and noticed "Biohazard Level 2 restricted" on the inner door. I asked the worker if they had Biohazard level 2 training, and they replied "What is biohazard level 2?". Then recommended they not enter if they did not have training. They reported to their supervisor that they were "not allowed to enter".

Near Miss or Unsafe Condition

Near Miss or Unsafe Condition

Faculty of Science

1

1

2021

This incident report relates to an ongoing noise issue since March 2021. The problem is located at the doors of [REDACTED] L2-317. My workplace is directly across from this location. I hear a non-stop high pitched whistling noise coming from the doors. I am reporting this issue today because I now get headaches from this noise and it disrupts my ability to concentrate and do my work. I believe the best solution to this problem is to install ventilation grills on the doors. This change would remove the large pressure difference between the hallway and interior of the room [REDACTED] L2-317, which would remove the direct cause of the whistling noise. I've included a URL to 3 files sharable to [REDACTED] affiliates. It shows: \* A video recording of the whistling noise at [REDACTED] L2-317 \* A picture of the doors to [REDACTED] L2-317 \* A picture of another set of doors with ventilation grills already installed. It is an example of a configuration that I believe will fix the problem.

[REDACTED] I am really hoping that someone can help me out with this fix. Thank you.

Other  
Injury/Illness  
(Including sprains  
and strains)      Near Miss or Unsafe  
Condition      no      Head      no

[REDACTED] W1-51 is an active remediation site for legacy mercury (signage indicating No-Entry Hazardous Spill was posted on both doors in January), but was entered on Sunday night (June 13th) and was cleaned by [REDACTED] staff. Positive indicator powder and Mercon was mopped up, but the total amounts of mercury on the floor in the area of the previous mercury spill is estimated to be <1 mL and there were trace amounts on the floor in other areas of the lab. The mop and bucket used have been taken out of service and will be disposed of through [REDACTED].

Environmental  
Release      Environmental  
Release

A thermometer was broken by incident and two small drops of mercury were spilled onto the bench inside the fumehood. Sulfur powder was applied onto the surface and everything contaminated (paper towel, gloves) was transferred into a plastic zip bag.

Other      Property Damage

Building Services Staff cleaning lab areas in [REDACTED] 2 building that are rated at Biosafety Level 1. According to Custodial Supervisor [REDACTED] staff are not supposed to do this. It is not clear why services were performed in those areas. Custodial Supervisor and Building Manager [REDACTED] have asked for clarification on this matter. Rooms include: [REDACTED] 5-104, 5-119, 5-149, 5-155, 5-156

Near Miss or Unsafe  
Condition      Near Miss or Unsafe  
Condition

On three separate occasions the trash receptacles, containing hazardous waste, inside of our lab have been emptied by the cleaning staff. On the first occasion the lab garbage cans were found empty (morning of May 19th) and it was initially believed to be a mistake with the recent switch in cleaning contractors. During the morning of May 26th, the garbage was once again found to be empty. After this incident, it was found that one of the lab doors was missing a "No Entry" sticker and F&O were contacted (through \*) to obtain a sticker for the door (this was put on the door on May 27th). Finally, the third incident occurred on June 2nd, as the garbage cans were once again found to be emptied in the morning. This incident was again brought to the attention of \* and at this point we have been told that the Building Manager and [REDACTED]'s Operational Director have been informed of the issue and that the cleaning staff will not enter the lab space again.

Near Miss or Unsafe  
Condition      Near Miss or Unsafe  
Condition

Faculty of Science	1	1	2021
Faculty of Science	1	3	2021
Faculty of Science	1	2	2021
Faculty of Science	1	1	2021
Faculty of Science	1	2	2021

While transferring dichloromethane (DCM) solution from a 20 mL glass vial to a 2 mL GC vial, the vial of DCM slipped through my gloved hand and bounced on the fumehood benchtop, spraying DCM in a small radius around when it hit. The solution splashed on my hands, bare wrists, and lab coat sleeves. I immediately took off my gloves and lab coat and rinsed my wrists with tap water at the sink for 2 minutes.

Exposure to Hazardous Substance

Exposure to Hazardous Substance

Absorption /Skin Chemical Contact

no

Faculty of Science

1 2

2021 chemical

Two workers were in B-608 doing abatement (asbestos?) without prior notification. They used something with a strong smell. Our lab needs to be notified of such work due to the occupancy limits for our workspace and to avoid potential exposure to harmful substances.

Near Miss or Unsafe Condition

Near Miss or Unsafe Condition

Faculty of Science

1 1

2021

On Sunday May 2, 2021 water sensors informed research staff that water was present. When they went to check, it was significantly more serious than anticipated.

Property Damage

Property Damage

Faculty of Science

2 3

2021

When the eye wash station in L1-007 was used in connection with previously reported INC00000653, the large volume of water that discharged onto the floor was deemed a hazard by the attending teaching assistant (TA). Use of the eye wash was discontinued and hand held eye wash bottles were used to complete first aid. The TA (\*) reported concerns relating to slip/fall injury and electrocution risk from the large amount of water discharged. Infrastructure damage was also a probable outcome of continued use of the eye wash station. The eye wash stations were taken out of use immediately and hand held eye wash bottles were provided instead to finish the term. (L1-007 and L1-008 (also affected by the issue) are teaching labs). A simulation of the eye wash operation has subsequently been carried out and is available at [redacted]

[redacted] Note that the video shows only about 15 seconds of flow where as 15 MINUTES is the normal eye wash time recommended in most SDS sheets. The situation with the eye wash has been known ever since [redacted] was occupied. Vehement objections to the improper installation of the eye wash (specifically, lack of direct connection to a drain line) were made at the time but we were told by administration "to live with it". This is the first time the eye wash has been used in an emergency situation in the lab, and it is clearly both unacceptable (as predicted), creates a dangerous situation for all occupants of the laboratory (slip/fall and electrocution risk), and creates the likelihood of infrastructure and other University property damage. Additional observations are that the concrete floor is improperly graded. The floor drain occurs at a high point, rather than the normal shallow depression that is standard in other situations. The lack of a shallow depression leading to the floor drain results in the flood waters from the

Near Miss or Unsafe Condition

Near Miss or Unsafe Condition

Faculty of Science

1 3

2021

During the development of a piece of new behavioural equipment, I needed to remove some dried glue and was using a razor blade to do this. Due to impatience I briefly shifted to improper technique and cut towards my other hand that held the equipment. The razor blade slipped and cut into the tip of my thumb on the opposite hand leaving a deep gash. I quickly rushed to the local ER [redacted] Hospital [redacted] Hospital). After cleaning the wound, they used skin glue to seal it and stop the bleeding and released me.

Injury/Illness (Including sprains and strains)

Injury/Illness (Including sprains and strains)

no

Fingers yes

Emergency Department

Faculty of Science

3 3

2021 cut

Ms \* suffered a severe allergic reaction in the lab (Room 1-14 in the [redacted] Building). We had a prior mouse infestation on the main floor of [redacted] which had been remediated by E [redacted] t. Further lab cleaning may have aerosolized some remaining allergens which then triggered Ms \*'s reaction.

Other

Exposure to Hazardous Substance

Faculty of Science

3 3

2021 allergy

Right little finger was burned by Bunsen burner flame while inoculating a culture.	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Fingers	yes	Did not receive any further medical attention	Faculty of Science	2	2	2021 burn
During my C 243 lab, I sprayed a small amount of DCM (dichloromethane) on my forehead. The liquid dripped down over my right eyebrow, and may have made contact with my right eye. I stopped working immediately, briefly talked to my lab TA for advise, and quickly rinsed my forehead and my eyes with water for at least 5 minutes. I then rinsed my eyes with saline solution. Before rinsing my eyes, there was a localized stinging sensation on my forehead and more importantly, my eyes did not feel sensitive. With the possibility of eye contact, I rinsed my eyes to be safe. After rinsing with water and saline solution, my eyes felt alright.	Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Contact with eye/nose/mouth	Absorption/Skin Contact	no	Faculty of Science	1	3	2021 chemical
April 1st 2021 used syringes, gloves, needle covers and an exposed used needle was discovered in a garbage in room EB-44, east chemistry building. Instrument logs were consulted and cross-referenced for the known time (i.e. between 9:30am when instruments were filled with cryogens and 3pm when new user training was done and needles discovered). More used syringes and needles discovered in "Sharps" container in the fume hood. All instrument users were questioned and the person responsible found. We reviewed safe handling procedures and are now convinced this will not happen again. Long nose tweezers were used to go through the garbage piece by piece and remove all syringe associated equipment. The garbage was fully emptied, checked and returned to service. All syringe products were disposed in the sharps container.	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition					Faculty of Science	1	3	2021
A clear fluid (pH 11-12), is dripping from a previously patched pipe down the wall and behind the fume hood in WB-61. The lab bench, and wet areas on the floor all tested with a pH between 11-12. This is a very similar incident to the one that occurred last year in the same lab, but stopped once the pipe was patched. Speaking with the occupants in an adjacent lab (department lab), it appears that the leak is much more significant in the mechanical room to the East of WB-61, which shares a wall. The fluid leaking into this space is constant and requires mopping up a few times a day by a building service worker. At this time, I do not know who is cleaning up this fluid and if they are aware that it is not water. I was told that F&O is aware of the plumbing issue and will be sending someone to fix the issue in the coming weeks. In WB-61, the leak was cleaned up and bagged. In case of an ongoing leak, absorbent spill pads were placed on the lab bench, along the floor in front of the fume hood, under the bench where wet spots were observed and a spill sock was circled around the floor drain.	Environmental Release	Environmental Release					Faculty of Science	2	3	2021

On Monday (March 1st) I began working as a Research Assistant in the \* lab. When I first arrived, I was cleaning out the fume hood and a small piece of glass from a cover slip cut my finger. A few hours later my finger was swollen and a fairly good sized bruise had developed around the area. I marked the injury with a pen, and \* told me to see a doctor if it got worse. It did not get worse, however I had a doctors appointment that evening already, in which he looked at my finger and prescribed me antibiotics just in case it were to become infected.

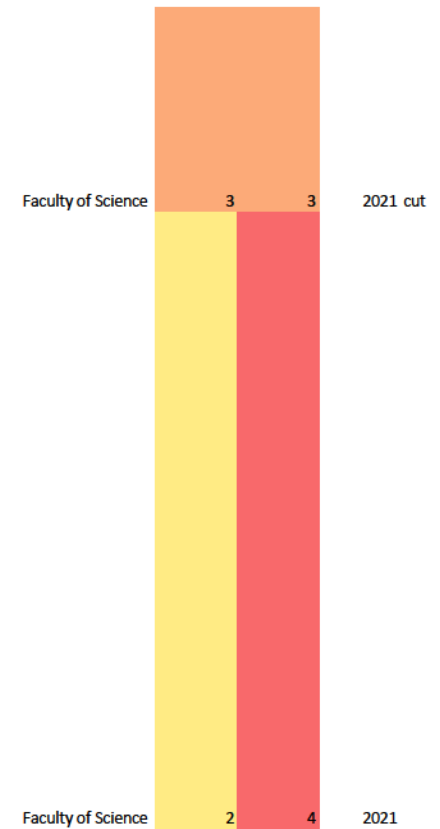
Other

Injury/Illness  
(Including sprains  
and strains)

Water leaking from the ceiling in █ 4-250. We can supply a video and photos upon request. The water was coming into the lab from the ceiling like a rain storm. Fortunately, because of our safety protocols the HF fumehood was closed and VERY hazardous reagents (hydrofluoric acid) were not compromised. This lab houses two hazardous materials fumehoods (HF and perchloric acid) as well as a sensitive furnace. The Facilities staff indicated this event was because of the build up of ice from condensation in the mechanical room on the floor above and that the ice melted and flowed into the building. The staff also indicated there was nothing that could be done other than wait because the water entered the concrete and needed to run dry. This is the second time this has happened in approximately this region and for the apparent same reason, the other was approximately two years ago when there was a severe rain storm in the summer that flooded two fumehoods in █ 4-236. This event may explain why the perchloric acid hood in █ 4-250 simply does not work any more as it stopped working approximately the time of the first this occurred. This is a very serious safety concern because, had someone been working in that room with HF at the time of the present incident they could easily have been distracted and the outcome could have been deadly. Similarly, had the furnace, that would costs 10s of thousands of \$ to replace, been in operation and "rained on" it could have lead to serious and costly consequences. We really need a permanent solution to stop this from happening again.

Near Miss or Unsafe  
Condition

Property Damage



A graduate student in my group, inadvertently shipped some strains of the mouse pathogen *Citrobacter rodentium* (risk level 2) as a risk level 1 bacteria. The strains were inoculated in plastic screw top tubes and placed in a bag with adsorbant, and then double-bagged. They were shipped with a label describing the contents through SMS on Dec 9 and received by our collaborators at \*, intact, on Dec 11. A biotransfer request was submitted to EHS and signed by myself in January, which alerted me to this situation. Here is the graduate student's account of the incident: I was made aware that there is a difference in shipping level 1 strains and level 2. If the strain is level 2 it has to go through [redacted] stores but if its level 1 then it can just be picked up by [redacted] from the lab as long as you fill out the shipping form and attach it to the box. I had \* (another grad student in the lab who is registered through EHS to track and administer lab activities) submit a biotransfer request just in case because at the time I wasn't sure whether it was level 1 or 2. So in that I didn't know whether *Citrobacter rodentium* would be considered a level 1 or 2 pathogen I tried to find that information online. Since I work in an industry lab that uses ATCC strains I checked their website to see what it was classified as. On the ATCC website it classifies *Citrobacter Rodentium* as a level 1 biosafety organism. I printed off this page to keep for my records. I was not aware that the classification of organisms differs based on country or what website you go on. I then prepped the strains to be shipped by making stab agar cultures in screw cap tubes in the bag I prepared with absorbent material and then they were double bagged and put in the box that I had attached the shipping form to. On Dec 9 we received word that the lab would need to be shut down because of provincial restrictions so in an effort to have the strains shipped before that happened I emailed SMS asking if the biotransfer request for the 6 strains of level 1 *Citrobacter Rodentium*

Other

Near Miss or Unsafe Condition

Faculty of Science

1

3

2021

In the afternoon (~3pm) at [redacted] 089 (\* group), the new graduate student \* broke a glass bottle of glacial acetic acid (~2 L). The incident happened when he moved the bottle from the storage cabinet to the bench and somehow the bottom of the bottle was broken down into pieces. All the acetic acid spilled out from the bench to the floor, as well as the drawers underneath. I called the Control Centre: \* immediately and then was called back by EHS to describe the incident and receive assistance. I also covered most of the acetic acid on the floor with Universal Sorbent Pads. In the meantime, my colleague Dr. \* stayed with \* to help him with the emergency shower, changing clothes, and rinsing the skins that were potentially exposed to the acetic acid with 1% sodium bicarbonate. Then Dr. \* from EHS came to help. She dissolved a total of ~ 5kg sodium bicarbonate in water and mixed the solution with acetic acid on the floor, benches, drawers, etc, to neutralize the acid to pH ~7. The Chemistry Department store supervisor \* also brought a big bag of spill mix, which \* placed on the neutralized mixture. The contaminated materials were collected in the EHS certified black plastic bags (double sealed). Finally, the room was vacated and vented overnight. \* also asked me to go outdoors for 15 minutes to breathe fresh air. My colleague and I will clean the lab and rinse it with a large amount of water tomorrow.

Other

Environmental Release

Exposure to Hazardous Substance

Faculty of Science

2

4

2021 chemical

I was pouring some organic chemicals into a beaker and a very small amount may have got into my eye. I wasn't 100% sure if anything even got in my eye because it could have just been my eye eyelash poking my goggles or something. I proceeded to wash my eyes out as a precaution.

Other

Exposure to Hazardous Substance

Faculty of Science

1

1

2021 eye



Was doing a chemistry experiment in L1-024 in [redacted] with \* as TA. Attempted to reflux under inert argon atmosphere a mixture of trichlorophosphate, glacial acetic acid and 4-hydroxycoumarin. Argon balloon was placed too low near the refluxing vapors and collected a couple mL of condensed liquid in the syringe/needle and balloon. The balloon popped after I held the sagging balloon up. The vapors got in my face and I removed the argon balloon needle. Washed my eyes out for 10-15min in the lab eyewash station, was then told to visit the university clinic where I continued to eyewash for 10-15min and then see a doctor for eyes and lungs check. My eyes initially stung pretty bad but the initial eyewash was definitely helpful, although I could definitely still smell vinegar after leaving for home and my phlegm tasted tangy. At this point though about 7 hours later I feel mostly alright, headaches are expected but I can't tell if my lungs hurt because of walking in the cold (covid lungs) or if it's the fumes doing. But doc said I should be good after tomorrow.

Exposure to Hazardous Substance      Exposure to Hazardous Substance      Contact with eye/nose/mouth      Chemical Inhalation

yes      University Health Centre      Faculty of Science



2021 eye

During a 265 lab (section H17 TA: \*) noticed a burning hair smell. He looked over and noticed a student who's hair was smoking. She had singed her hair while using the bunsen burner. \* had showed the students how to properly use the burner and told them to be careful. I followed up with the student: \*, the next day and she said the following: I'm doing well, lucky it was just a bit of my bangs that became crispy but it's virtually all better now! I think what caused my accident was that i forgot to let the gas clear before retrying to light my bunsen burner; that and having its setting for the flame way too high. I've never been super comfortable working with bunsen burners but yesterday was definitely a learning curve for me. I CANNOT FIND MY DEPARTMENT IN THE PULL DOWN MENU - [redacted] I finally found it, but it is very confusing. This should be made more clear.

Near Miss or Unsafe Condition      Near Miss or Unsafe Condition

Faculty of Science



2021

While working in the HF lab, I accidentally knocked over a teflon beaker containing 9 mL of 16% HF. I neutralized the spill with CaCl2 and placed down several paper towels. I put all of the contaminated waste into a plastic bag. The incident occurred when I removed my 2 layers of gloves (latex and nitrile), as I put the gloves in the contaminated waste bag my finger accidentally touched the inside of the bag, which was wet. I immediately washed for 5 minutes with water. I noticed a very tiny acid burn mark so I immediately applied calcium gluconate. I then filled a bucket with ice and poured in a solution of 0.13% benzalkonium chloride and soaked the affected finger in it. I called a fellow lab member that was onsite at the incident and had them contact 2-555 and our supervisor. We then proceeded to the ER where I was assessed. The doctor told us the injury was very minor and we had done everything right with our procedure, but performed a Ca blood test just in case. The results came back good and I was released.

Injury/Illness (Including sprains and strains)      Injury/Illness (Including sprains and strains)

no      Fingers      no

Faculty of Science



2021 burn



Entered room #1-32 from the south door and found mercury on the floor from the doorway extending south to the fumehoods, then heading west to the exterior wall. Total visible affected area was likely close to 20-25 linear feet, square footage I would estimate as 75+ sqft. The droplets were both large and small, the largest of which being just under dime-sized. The droplet patterns were also variable, with numerous tiny droplets on the floor below a wall mounted barometer as well as on the wall below the barometer. This indicated to me that the area below the barometer may have been the impact epicentre, causing a large amount of mercury to be forcibly sprayed into tiny particles across a large surface area, with larger particles at the periphery of this potential impact zone. The barometer is currently missing from the wall, and a large (~4") piece of glass with similar size, diameter and appearance to barometer glass was found ~3' South of the barometer's wall mount, on the floor, filled with mercury. 2 large beads of mercury (~dime sized) were found within a 2' radius of this piece of glassware, one visible and one under a cart. Interestingly there were more medium sized (~4-5mm) droplets of mercury under the cart and under a lab stool, whereas the open floor had many more droplets overall but of smaller size (~1-2mm), indicating to me that the floor had been swept. I also observed that there were numerous tiny droplets caught on the edges of a large decal on the floor in front of the fumehood, there were a number of broom hairs on the floor, and the broom and dustpan in the room looked like they had been recently cleaned, further suggesting that an effort had been made to sweep up the mercury, as well as the rest of the missing barometer (if that was the source). The cleanup method included donning tyvek booties, labcoat, thick nitrile gloves, safety glasses and a respirator equipped with mercury cartridges. I approached from the south door and used the mercury In 4-146, LiAlH4 was quenched in a vial using ethanol. Enough heat was generated to boil the ethanol used to quench the substance, and ethanol ignited. The D-class fire extinguisher was then used to extinguish the fire.

Hurt back while working

At 9 am this morning I noticed a clear liquid dripping from the ceiling/drip tray above one of our work stations (gel electrophoresis equipment) in G104. Although the equipment was not dripped on, there was a 15 cm diameter wet spot on the bench and some liquid on the floor by the bench. I do not know what this liquid is and am not comfortable with a drip tray potentially full of an unknown liquid above my head. We are a preparatory lab located below the loading dock in and this is not the first time we have had leaks of unknown origin dripping on us. I called the maintenance desk to report it and placed a bucket under the drip.

Found a damaged bottle of maleic anhydride while sorting hazardous waste chemicals at the facility. The item was submitted by \* group. Corrosive chemical was spilling out, there was no secondary container. Pictures can be provided upon request.

cut by the glass in the lab, a broken pipet.

Environmental Release	Environmental Release				
Near Miss or Unsafe Condition	Environmental Release				
Near Miss or Unsafe Condition	Property Damage				
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)				
		no	Back	no	
Near Miss or Unsafe Condition	Near Miss or Unsafe Condition				
Near Miss or Unsafe Condition	Near Miss or Unsafe Condition				
Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)				

Faculty of Science

2 3 2021

Faculty of Science

2 3 2020

Faculty of Science

2 3 2020 strain

Faculty of Science

1 2 2020

Faculty of Science

1 3 2020

Faculty of Science

2 3 2020 cut

Did not receive any further medical attention

\* accidentally knocked over a bottle containing ~10mL of 100% acetonitrile. As it fell to the floor (did not break) ~1mL escaped the bottle and contacted \*'s lower pant leg (below the knee), resulting in what he described as a cool sensation (likely due to the rapid evaporation of the acetonitrile). Upon this event \* immediately proceeded to add water to his pant leg. He then called me and I instructed him to remove his pants and rinse the area with water as per the SDS. This rinsing was performed for 30minutes continuously over the eye wash station drain. As this was occurring I chatted with poison control and then \*. Based on their advice, we bagged up devangs clothes and lab coat. \* then stayed the evening with me at my house as the effects of ACN exposure can take upto 13h to present symptoms (according to poison control). There was no need for any followup as \* did not present any symptoms of cyanide poisoning.

Exposure to Hazardous Substance      Exposure to Hazardous Substance      Absorption /Skin Contact

no

Faculty of Science

1

3

2020 chemical

\* group discovered damaged bottle of mercuric nitrate in a secondary container with oxidizers stored in the flammable cabinet. They contacted me by email on October 1, 2020. During my lab visit on October 2 I saw a cracked bottle of mercuric nitrate and another cracked one was sodium nitrate. Contents of both bottles spilled into the secondary container (plastic tub), (presumably) mixed with air moisture and created corrosive highly toxic sludge. Other bottles stored in the tub were contaminated by the spill. The tub was moved into the fumehood. All chemical containers were placed into secondary containers for disposal. The liquid in the tub was absorbed by the spill mix. The tub and other contaminated materials were also packed for disposal. I was removing a glass pipette from the rubber suction. I did not have a good handle on the pipette and it broke in two, as it slit it cut my right index finger.

Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains)      Near Miss or Unsafe Condition Injury/Illness (Including sprains and strains)

no

Fingers      yes

Faculty of Science

1

3

2020

Faculty of Science

2

3

2020 cut

Beginning in April 2017 I began to develop allergies to the rats that I provided daily husbandry to. Initially I primarily experienced a runny nose and sneezing in the animal rooms. After one month I began wearing an N95 respirator and gloves in addition to my cotton gown and scrubs. Over many months the allergy progressed despite attempting to increase my levels of personal protective equipment (PPE). In approximately December of 2018 I was scheduled to train in another department. In August of 2019 I returned to working with the rats and my allergies were significantly worse. I was experiencing a runny nose, sneezing, itchy eyes, hives on my skin, and chronic congestion over 24 hours both inside and outside of the animal rooms. I increased my PPE to a level 3 waterproof gowns stored outside of the animal rooms as well as double gloves, a hairnet and a half face respirator that I wore inside and outside of the animal rooms. In November of 2019 I received a note from my family physician recommending I be re-scheduled to an area without rats and in December of 2019 I began to work in another area. I have worked very minimally with the rats since while I await an appointment with an allergy specialist in the fall of 2020.

Other

Injury/Illness (Including sprains and strains)

Faculty of Science

3

4

2020 allergy

In the process of moving a relatively large instrument in our research lab, two members of the mass spectrometry facility in chemistry were lifting the instrument onto a cart for transport. From what they described to me, the instrument slipped suddenly and fell on the thumb of one of them, \*. Her thumb had skin peel off in two places and she described it as feeling numb. We disinfected the wounds and used two bandages as a temporary splint and to stop the bleeding. I asked if she required further assistance and she replied that she would let me know.

Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	no	Hands	yes	Did not receive any further medical attention	Faculty of Science	2	3	2020 pinch
Exposure to Hazardous Substance	Exposure to Hazardous Substance	Absorption /Skin Contact	Chemical	yes	University Health Centre	Faculty of Science	2	2	2020 chemical

Our lab received a shipment of phenol accompanied by a bottle of equilibration buffer, for exact product description see: [https://www.sigmaaldrich.com/catalog/product/sigma/p4557?lang=en&on=CA&gclid=EAlalQobChMlx4mun52W6wiVExmCh2euwHQEAYASAAEgJ2jPD\\_BwE](https://www.sigmaaldrich.com/catalog/product/sigma/p4557?lang=en&on=CA&gclid=EAlalQobChMlx4mun52W6wiVExmCh2euwHQEAYASAAEgJ2jPD_BwE) The tin container in which the products were shipped was opened, and absorbent wadding removed. The bottles of phenol and buffer were contained in a vacuum sealed package, which I cut open (wearing two pairs of gloves, a lab coat, and safety glasses) inside a fume hood, but with the doors wide open. However upon opening the vacuum pack I noticed the bottles and vacuum packaging were covered in phenol, as the cap had not been secured properly on the bottle of phenol by the supplier. I immediately closed the fume hood containing the package (tin container, absorbent wadding, bottles, and vacuum pack), so I was briefly exposed to phenol fumes/vapour. Following this I immediately removed my gloves and rinsed my hands. To secure the contents of the package, I put on new gloves (2 pairs) and placed the bottles and vacuum pack back in the tin container wrapped in the absorbent wadding. I then sealed the container the best I could using parafilm, aluminum foil and tape, and placed the entire package back in the fume hood with the doors closed (and a sign instructing no one to open the fume hood). The package is now awaiting proper disposal.

Exposure to Hazardous Substance	Near Miss or Unsafe Condition	Near Miss or Unsafe Condition	Chemical	Inhalation	no	Faculty of Science	1	2	2020
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I am an Animal Technician at [redacted] vices, [redacted]. I was euthanizing a carp fish and I had to decapitate and pith fish's brain, while pithing the fish spinal cord with a needle I poked myself. Needle went to the fish first and slid into my thumb.

Other	Injury/Illness (Including sprains and strains)					Faculty of Science	2	2	2020 k needlestick
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I broke an NMR tube that had methanol, in my hand while handling the sample. I was handling multiple tubes and I think, I have applied a pressure on one.

Exposure to Hazardous Substance	Exposure to Hazardous Substance	Absorption /Skin Contact	Chemical	no	Fingers	Faculty of Science	1	2	2020 chemical
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At 2.10pm, around 100g of corrosive NaOH was reacted with deionised water in a plastic container on a bench top rather than in the fume cupboard. After 5-7 minutes of reaction, people in the lab began to cough and the containers were swiftly moved to the fume hood. The lab was evacuated at around 2.15pm.

Exposure to Hazardous Substance	Exposure to Hazardous Substance	Chemical	Inhalation	no		Faculty of Science	2	3	2020 chemical
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Shortly after I started at [redacted] in September 2009 I filled out a fit testing request and reported that I do have animal allergies and asthma. I was requested to see a doctor at the [redacted] and then scheduled for an allergy test relating to the animals I was working with. I did have an allergic response to rats and mice during the test. Since then I ensure I wear an N95 when working with mice and rats and try and reduce exposure by use of an animal change station. No additional medication was required based on what I was already currently taking and I never developed any more severe symptoms. I currently work primarily in the aquatics facility and exposure to these rodents is very low.

I was in the cleanlab (HH 1-15) on my way to my workstation when I suddenly felt dizzy and clammy. I went out of the lab, lay on the ground and called a colleague. They called the ambulance. The ambulance took me to the hospital because I was still dizzy and had super low blood pressure.

Starting April of 2017 upon my hire I began working with rats. I was not required to wear any PPE other than my scrubs and a cotton back fastening gown. After about 1 month, starting in May of 2017 I started to get a runny nose and sneeze after being in the rat housing rooms for a prolonged period of time. It was at this time that I started to wear an N95 mask as a personal choice when working in the rat housing rooms. I would remove the mask when in common areas such as storage areas and hallways. I notified my supervisor that I had begun wearing increased levels of PPE and she assured me I was taking the correct steps by using more PPE if my allergy worsened. My first Respirator fit test took place on April 20th, 2017. My second fit test occurred on September 9th, 2019. I was assigned a half-face respirator in the facility in approximately August of 2019. Animal rooms were washed weekly at this time for cleanliness purposes as well as allergy reduction. Common room and hallway cleaning is supposed to occur 1-2 a year as outlined in our SOPs however this has not been achieved since my hire to my knowledge. Animal facility users are not required to drape or contain rat cages when transporting them throughout the facility and rats are housed in open-air cages. Individually ventilated rat cages became available for use in approximately August of 2018. The individually ventilated cages have yet to be installed to the present date. Currently we have reduced cleaning to every 2-4 weeks. I worked with the rats from April of 2017 until about September of 2018. After about 6 months I began to wear nitrile gloves in addition to the N95 as I noticed I would develop itchy hives along my hands, wrists or forearms only if my skin was broken (ie. scratched by a rats nails, scratch from rat equipment or supplies), however many times the nitrile gloves would easily tear as well. Starting in about April of 2018 I began to train in other areas of the facilities away from the rats. In September of 2018 I moved

Developed Laboratory Animal Allergies

Category	Other	Injury/Illness (Including sprains and strains)	Injury/Illness (Including sprains and strains)	Head	Legs	Other	Eyes	Hands	no	no	Faculty of Science	Faculty of Science	Faculty of Science	Faculty of Science	2020	2020 medical	2020 allergy	2020 allergy
Near Miss or Unsafe Condition											1	1						
Injury/Illness (Including sprains and strains)											3	3						
Injury/Illness (Including sprains and strains)											3	4						
Injury/Illness (Including sprains and strains)											3	4						

Stopped by the lab to check COVID-19 work plan compliance (at about 11:30 am). Immediately noticed strong chemical smell. All fume hood alarms in the room were going off (both sound alarm and blinking red lights). Two students were actively working in the fume hoods. Students confirmed they were also not aware of the fume hood maintenance work done in the building earlier that same morning. The notice of fume hood maintenance was posted at the 1st floor elevators zone. The lab next door (\*) was aware of it and did not do any work in the lab at that time. Regardless of the notice and maintenance work, the lab members should be aware that fumehoods cannot be used if alarms are activated.

Exposure to Hazardous Substance  
 Exposure to Hazardous Substance  
 Near Miss or Unsafe Condition

Chemical Inhalation

no

Faculty of Science



2020 chemical

Mr. \*, a technician in the Department of Biology, slipped while using a belt sander, removing the tips of two fingers. He was working on Fein GX 752H pedestal sander, sanding wood edges, and flattening the rough side of the wedges by using the top flat part of the belt sander. The sanding surface he was using to sand the wedges was orientated in a horizontal position, and he was pushing the part down on to the moving belt surface, when the belt grabbed the wood wedge and pulled it out of his hand. The tips of his middle and index finger of his right hand made contact with the sanding belt and injured his fingers. At the shop, his team cleaned the injury and applied Polysporin and Band-Aids. \* went to the doctor and reported back to his supervisor, \*, by telephone that the doctor's assessment was "degloving" and he would be off work until June 01, 2020. Mr. \* returned to work today, June 01.

Injury/Illness (Including sprains and strains)  
 Injury/Illness (Including sprains and strains)

yes

Less than 3 days

Fingers

yes

University Health Centre

Faculty of Science



2020 cut

I was cleaning out the inside of a drawer with Lysol when I stuck my finger with a shattered piece of coverslip.

Injury/Illness (Including sprains and strains)  
 Injury/Illness (Including sprains and strains)

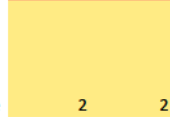
no

Fingers

yes

Did not receive any further medical attention

Faculty of Science



2020 cut