March 27, 2018

To the 2018 CSHEMA Awards and Recognition Committee:

On behalf of the University of Alabama at Birmingham, Emergency Management, Office of Occupational Health & Safety, I am writing to give my enthusiastic endorsement to UAB's Research Safety submission for the 2018 CSHEMA Innovation Award. This includes the following submissions:

Process Improvement: Innovative Method of Training; A Tiered Approach to Laboratory Safety and Emergency Response Training: Providing Hands-On, Cost Effective Training to a Large Group of Students

This innovative method of training has greatly benefitted the University of Alabama at Birmingham by developing a safety training program that is cost effective, easy to implement across the educational spectrum, is practical enough to train thousands of students per year and links theory and practice. This helps to improve safety conditions in our laboratories and other work places along with saving time and resources.

Thank you for this opportunity and we look forward to hearing from you very soon.

Sincerely,

[Signature]

Randy Pewitt, MPH
Executive Director of Emergency Management and Safety
Occupational Health & Safety
The University of Alabama at Birmingham
March 27, 2018

To the 2018 CSHEMA Awards and Recognition Committee

Regarding presentation: A Tiered Approach to Laboratory Safety and Emergency Response Training: Providing Hands-on, Cost Effective Training to a Large Group of Students

I am writing in support of the above presentation for a CSHEMA innovation award. I believe that the group has put together a projection that enhances our safety culture here at UAB. They developed this approach in response to a request from one of the departments at UAB after an incident in a lab showed that the lab teaching assistants were not adequately prepared for such events. This training was so well received that we extended an invitation to other departments or were invited by other departments to provide the presentation campus wide. I believe that this approach can be used by other institutions to promote a safe and healthy environment for our undergraduate labs.

By providing online training the hope is to address a larger number of students, especially undergraduate students that were not being reached before. By combining online PowerPoint presentations and videos and quizzes the goal is to provide meaningful and applicable training in a way that promotes greater retention of the subject matter. The hands-on portion is intended to reinforce the information provided by online and didactic training sessions. The hope is that the teaching assistants and graduate students will be better prepared to respond appropriately and timely should an incident occur in their labs.

Timothy J. Key, MD, MPH
Executive Director of Research Safety and Medical Director of Occupational Medicine
UAB Occupational Health & Safety
University of Alabama at Birmingham
2018 CSHEMA Innovation Award

Process Improvement: Innovative Method of Training or Educational Course

A Tiered Approach to Laboratory Safety and Emergency Response Training: Providing Hands-on, Cost Effective Training to a Large Group of Students

Problem:

In the Fall Semester of 2016, an undergraduate student had a sulfuric acid splash accident in a teaching lab. The teaching assistants and students panicked and delayed decontamination response by seeking a faculty member to ask for permission to use the safety shower and identify its location. The delayed response caused the student to suffer injury that may have been lessened or negated. While this incident was fresh, we asked some hard questions:

- How could this be prevented?
- Why was existing training ineffective?
- How can training and emergency plans be revised?
- What is the best approach to train thousands of students on emergency response?

Solution: A Tiered Approach to Safety Training with a Hands-on component

Our goal was to develop a safety training program that is:

- Cost effective
- Easy to implement across the educational spectrum
- Links theory and practice through a hands-on component in emergency response
- Is practical enough to train thousands of students during a year.
Knowledge that will change your world
The tiered approach (two tiers) divides graduate students and teaching assistants (TAs) into an advanced tier (Tier II) and undergraduate students into a basic tier (Tier I) of training.

Tier-II
TAs/Graduate Students

- Enrolled into a two-part training:
  1. An online course based on the R.A.M.P (Recognize the Hazards, Assess the Risk, Manage the hazards and Prepare for Emergencies) framework of risk management. The course consists of four standard modules, plus an additional department specific safety module
  2. A daylong hands-on safety workshop where students will practice on:
     - Operating safety shower/eyewash
     - Using fire extinguishers
     - Cleaning up spills
     - Conducting risk assessment and choosing appropriate PPE
     - Emergency response/evacuation and shelter in place
Knowledge that will change your world
The training is presented in the teaching labs so that TAs can get familiarized with their specific lab and safety equipment location, exits, etc. Each student receives a safety handbook “Everything to know about safety in labs” at the end of the session.

Tier-I

Undergraduate Students

- Undergraduate students enrolled in teaching labs will be trained online
  - Safety videos, a short course and a quiz before the first lab session
- Every lab session will begin with a brief experiment specific safety talk by the TAs and familiarization with the location and use of safety equipment.

How does the training work?

Occupational Health & Safety (OH&S) has developed an online safety training based on the R.A.M.P concept that can be assigned to students as needed. When OH&S schedules the date of the hands-on training with each department (Chemistry, Physics, Biology, Engineering etc.), the department provides a list of graduate students and TAs for that semester. The students will receive an assignment for the online training through the Learning Management System (LMS) and will be notified about the hands-on training date by the department (training time-line for Chemistry is below). Online training is a prerequisite for the hands-on workshop.

OH&S prepares safety-training kits for different sessions involved in the hands-on training and facilitates the training.

Undergraduate students are assigned to an online safety training involving modules, videos and quiz, as part of the course registration and completion of the training is a
Knowledge that will change your world

prerequisite for attending the lab. TAs review safety equipment, location and experiment specific safety concerns with the undergraduate students at the beginning of every lab.

Cost of Implementation for Chemistry Department

OH&S provided hands-on training to 128 TAs/Grads (Tier II) in the Chemistry Department during the fall semester and they trained 1500 undergrads (Tier I). The cost of training/student was $1.55 with staff salary and $0.43 without staff salary (Table).
Applicability at Other Institutions

Any institution could easily implement this training method to provide effective hands-on, face-to-face safety training to a large number of students at once in a very cost effective way. Our training approach allows students to not only receive classroom instructions but to also experience practical applications in a controlled environment. Hands-on training helps students achieve a higher level of knowledge and skill. Learning by doing ensures students will remember their safety training and use those skills in an emergency.