Improving research safety: Activities of the University of California Center for Laboratory Safety

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Created in 2011 following the death of Sheri Sangji at UCLA

Mission: Conduct research to provide evidence-based best safety practices in the laboratory

Impact on: Safety Culture, Compliance, Accidents, Injuries & Illnesses
Accident Investigations

University of Hawaii, Manoa

- Explosion of hydrogen/oxygen tank in Hawaii Natural Energy Institute lab
- Postdoc suffers serious injuries including loss of arm
- Reports released to public

California State University, Sacramento

- Spill in chemistry instructional lab
- Serious exposures of departmental staff during spill cleanup
- Reports were privileged

Insufficient: Risk assessment System support
Why do researchers not recognize the risk in the lab?

What can we do to prevent incidents?
Analyses of Lab Injuries at UCLA

**Injuries by department:** 19/62
Departments had more than 10 accidents in 7 years
Two departments experienced the majority of the lab accidents

**Injuries by type:** Sharps, chemical exposures, ergonomic problems and animal bites account for most injuries

Use injury data to guide safety program

Use incident and inspection data to guide safety program
Research on Laboratory Safety - Surveys

Objectives:
- Examine researchers’ safety behavior, attitude, communication
- Identify factors that influence the safety culture in research labs
- Identify factors that correlate with injuries

Safety culture survey 2018
4 universities, ~1000 participants
Survey: Researchers’ safety behavior

When working with hazardous materials, I wear the following PPE

Chem/Biochem trainees and staff have best overall PPE compliance but Med Health Sci has best lab coat compliance.

<table>
<thead>
<tr>
<th>Field</th>
<th>Lab coat</th>
<th>Eye/face protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health/Med Sci</td>
<td>92%</td>
<td>48%</td>
</tr>
<tr>
<td>Chem/Biochem</td>
<td>70%</td>
<td>76%</td>
</tr>
<tr>
<td>Engineering</td>
<td>63% 63%</td>
<td>40%</td>
</tr>
<tr>
<td>Neuro Sci</td>
<td>64%</td>
<td>58%</td>
</tr>
<tr>
<td>Bio Sci</td>
<td>29%</td>
<td>48%</td>
</tr>
<tr>
<td>Physical Sci</td>
<td>50%</td>
<td>48%</td>
</tr>
</tbody>
</table>

P<0.001
Survey: What affects safety culture?

Safety recognition by PIs correlates with safe lab practices and positive attitudes

Trainees & Staff agree:

- People in my lab incorporate safety measures into their experimental protocols.
- Time devoted to compliance with lab safety regulations is appropriate and valuable.

P<0.001

PIs

- PIs recognize safety behaviors: 88%
- PIs may/may not recognize safety behaviors: 59%
- PIs do NOT recognize safety behaviors: 29%

PIs significantly influence the safety culture of research labs
Survey: Risk Assessment Correlates with Minor Injuries

My PI discusses with me how to conduct experiments safely

- 70% Agree
- 12% Disagree
- 31% None

People in my lab incorporate safety measures into the protocols for their experiments

- 83% Agree
- 18% Disagree
- 6% None

Trainee and staff responses

Trainee and staff injuries

- More than one: 42%
- None: 70%
- More than one: 31%
- None: 12%

P<0.001
Take Home Message

• Safety behavior differs in different research areas
• PIs significantly influence the safety culture of their research labs
• Risk assessment contributes to injury prevention

What can we do?

➢ Lessons Learned
➢ Safety Training
➢ Support Student Activities
➢ Workshops
Lessons Learned—Lithium Aluminum Hydride Fires
Craig A. Merlic*, Carl J. Ferber, and Imke Schröder

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Lessons Learned—Fluoride Exposure
Glen S. Svenningsen, Benjamin R. Williams, Michael B. Blayney, Elizabeth Czornyj, Imke Schröder, and Craig A. Merlic*

ACS Chemical Health & Safety 2020, 27, 1, 40-42 (Letter)
Publication Date (Web): January 10, 2020

Lessons Learned—Aluminum Waste Container Rupture
Craig A. Merlic* and Imke Schröder

ACS Chemical Health & Safety 2021, 28, 1, 34-37
Publication Date (Web): November 20, 2020
DOI: 10.1021/acs.chems.0c00079

https://cls.ucla.edu
The image shows a section of an abrasive wheel impaled into safety glasses. This type of abrasive wheel is commonly used for cutting and grinding metal.

This is a good reminder to ALWAYS wear safety glasses while cutting, drilling, and grinding, especially when using power tools.

Created by the UC Center for Laboratory Safety
https://www.cls.ucla.edu
Non-profit organization consisting of 50+ research institutions
Create and share online safety training for researchers

Specialty Courses:
- PI responsibility
- Researchers’ Risk Assessment
- Aerosol Transmissible Disease
- Pyrophorics and Water-Reactives
- …
Workshops on Laboratory Safety

• Brings together academic researchers, EH&S professionals, administrators, and national lab researchers
• Presentations, panel discussions
• Workgroup sessions to problem-solve current safety topics and offer guidelines
• Generates new ideas

2023 Workshop planned for Sept 10-12 at UCLA

Organizing committee: Representatives from UCCLS, UCOP, NIH OID, ACS, Harvard U., Northwestern U., UCLA
Conclusion

- Use data to look for hotspots and devise interventions
- Make injury data available to researchers
- Use Lessons Learned to educate researchers
- Support students in safety activities

Collaborate with us!
Thank You

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