

# Supporting Scientists by Making Research Safer

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UC Center for Laboratory Safety

UCLA

# UC Center for Laboratory Safety



Founded in 2011 in response to tragic accident at UCLA

Tasked with improving the safety of researchers in laboratories

Safety  
Training

Lab Safety  
Workshops

Safety  
Culture  
Analysis

Accident  
Investigation

Safety  
Program  
Reviews

*Ideally, a strong culture of safety is the goal of a pro-active safety program to support cutting-edge science and technology.*

*Compliance with regulatory policies and injury prevention are outcomes of the safety culture.*

# 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



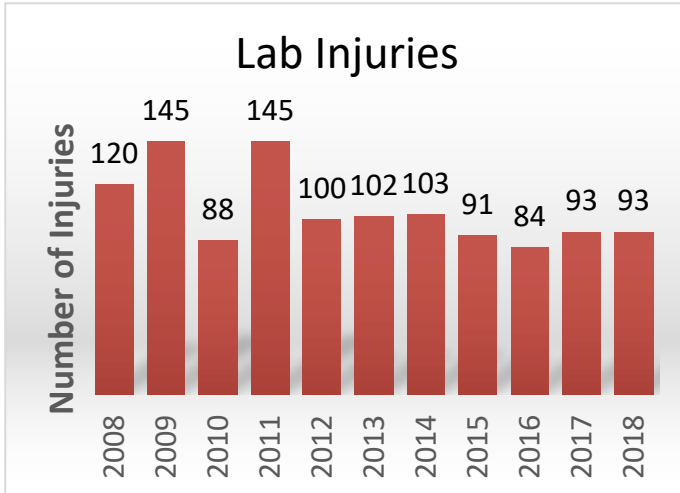
- Spill in chemistry instructional lab
- Serious exposures of departmental staff during spill cleanup
- Reports were privileged

# Hawaii and Sacramento Accidents

Why did the researchers not understand the risk?

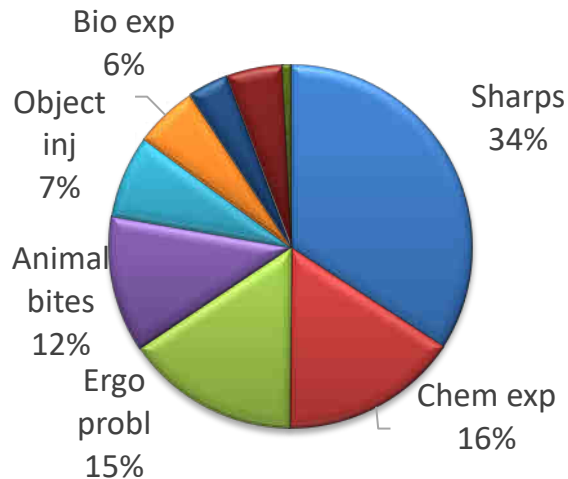
Can an individual transitioning from a strong culture of safety sustain their beliefs in an environment with a weaker safety culture?

# Analyses of Lab Incidents at UCLA



- A total of 1164 lab-related injuries occurred at UCLA in 11 years
- Lab injuries account for 8% of the total UCLA injuries (~1,400/year)

## Types of Injuries



- Sharps, chemical exposures, ergonomic problems and animal bites account for most injuries

## Take Home Message

Use data to look for hotspots and devise interventions.

Make injury data available to researchers. It is their right to know.

Use Lessons Learned to educate researchers.

# Lessons Learned

Cases from U.S. Universities: Use Lessons Learned to improve safety in your lab.



Fires/Explosions



Chemicals



Needlesticks



Slips/Falls



Animal Incidents



Biohazards



Radioactivity Incidents



Physical Hazards



Safety Tips



Published Lessons Learned

## LETTERS

### Lessons Learned—Fluoride Exposure

Glen S. Svenningsen, Benjamin R. Williams, Michael B. Blayney, Elizabeth Czornyj Schröder, and Craig A. Merlic\*

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



Journal of Chemical Health and Safety  
Volume 26, Issue 6, November–December 2019, Page 2



Letter to the Editor

### Lessons learned — Vacuum pump fire

Elizabeth Czornyj, Imke Schroeder, Nancy L. Wayne, Craig A. Merlic

Show more

<https://doi.org/10.1016/j.jchas.2019.05.003>

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# Incorporate Risk Assessment in Safety Training



Enable researchers to:

- Critically judge safety of experiments
- Assume responsibility for experiments
- Manage experimental changes including scale-up
- Competently respond in emergency situations



# Culture of Safety in the Research Environment

- Safety takes priority
- Safety is integrated into daily activities
- Researchers are engaged in safety activities
- Researchers are motivated to support safety activities
- Researchers are knowledgeable about hazards and risks
- Leadership is supportive of safety



# Safety Culture



Shared values, beliefs and behaviors resulting in a commitment to safety by everyone in an organization

# Measure Safety Culture

What is the difference between safety culture and safety climate?

## Safety Culture

- ✓ Stable, not subject to immediate change
- ✓ Part of the organizational culture
- ✓ Based on overarching policies and goals

## Safety Climate

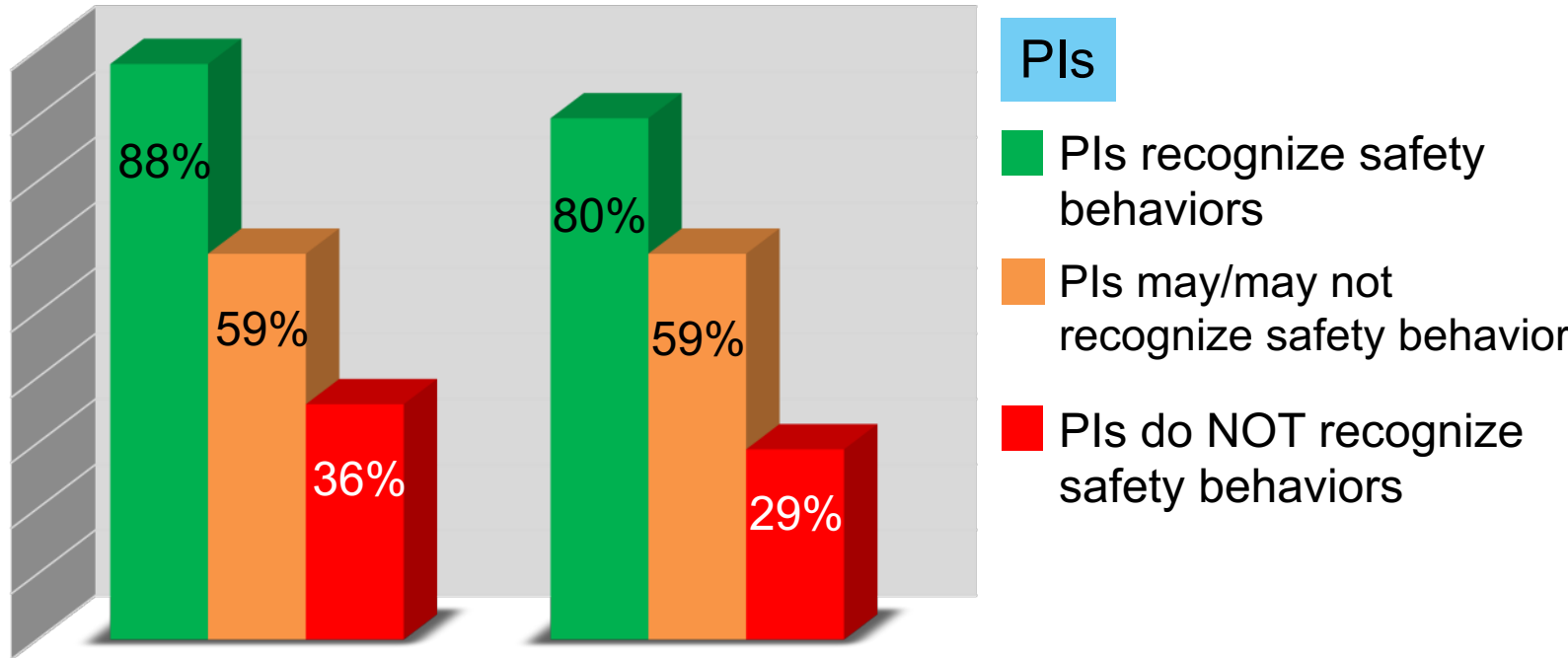
- ✓ How much we value safety **at this time**
- ✓ How much do leadership and worker values align
- ✓ Safety climate drives action/inaction
- ✓ Safety climate **can be influenced**
- ✓ **Safety culture is the underlying belief system of safety climate**

# Measure Safety Climate

- Short: 10 min
- 38 questions; 5-point Likert scale, 1 open-ended questions
- Bifurcated survey: Students, postdocs & staff vs PIs
- Areas:
  - Safety communication (9 items)
  - Safety attitude (6 items)
  - Safety training (3 items)
  - Safety behavior (10 items)
  - Self-reported accidents and near misses (4 items)
  - Demographics (5 items)

# Impact of PI Action on Trainees and Staff Safety

PI recognizing trainee/staff safety behavior



Trainees & Staff agree:

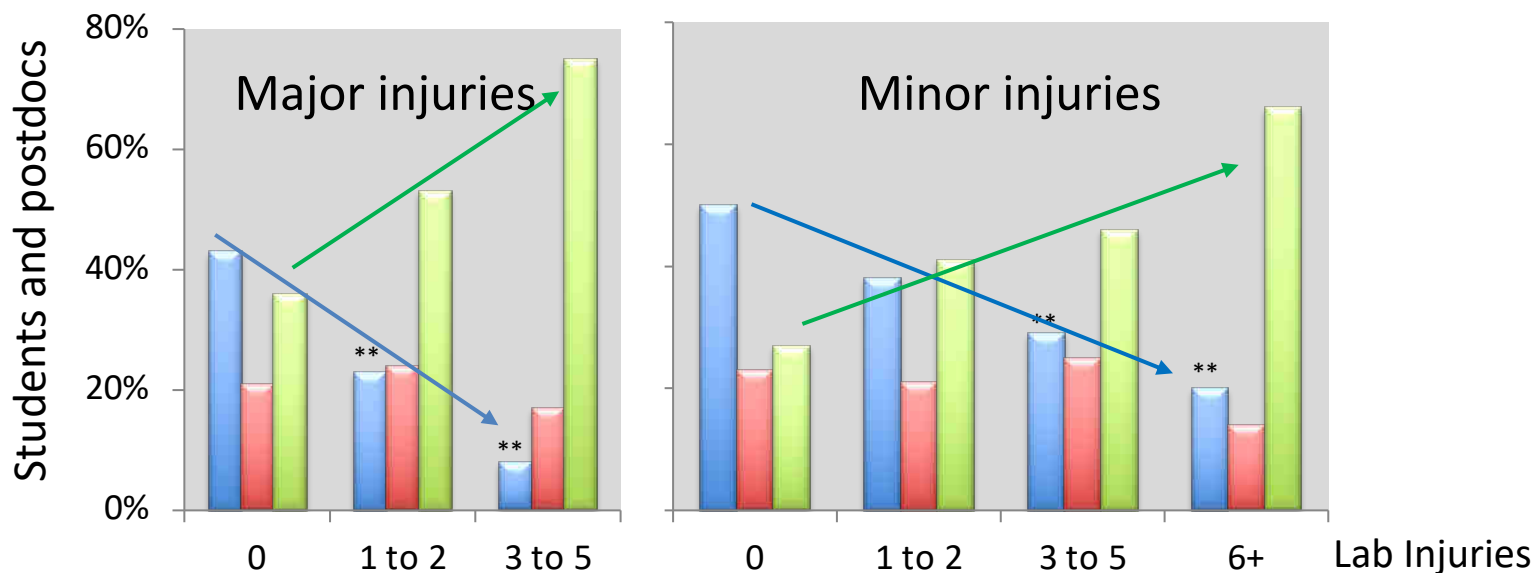
People in my lab incorporate safety measures into their experimental protocols.

Time devoted to compliance with lab safety regulations is appropriate and valuable.

P<0.001

# Impact of PI on Student Safety

Injuries witnessed or personally experienced by students and postdocs (n=406)



- PI monitors lab safety
- PI may or may not check safety
- PI does not monitor lab safety

# Take Home Message

PI actions can be more important for safety  
than EH&S actions

# Workshops on Laboratory Safety

- Bring together academic researchers, EH&S professionals, administrators, and national lab researchers
- Presentations, panel discussions, breakout sessions
- Workgroup sessions to problem-solve current safety topics and offer guidelines
- Generate new ideas
- Re-confirm existing beliefs



# What can Universities do to Better Prepare Students for the Future?



## Emphasizing Safety

- Standardizing safety across departments
- Research Proposals

## Collaborating with Industry

- Inviting speakers
- Field visits
- Insight into industrial safety culture

## Methods of Teaching Safety

- Case Studies
- Storytelling
- Leading by example

## Propagating Safety Culture

- Encouraging student led safety initiatives
- Hands-on training for lab TAs

# 2021 Laboratory Safety Workshop

Date: Beginning of May 2021

Location: Virtual, Broader Participation

Organizers: UC Center for Laboratory Safety, UCLA, UCOP,  
Northwestern University, National Institutes of Health, American  
Chemical Society

Topic: **Advancing Safety in Teaching and Research**

Speaker presentations, **Student Panel**, Breakout sessions

Fun activities, Networking opportunities

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