



What's the point of your story?

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Learning Laboratory Safety through Storytelling

August 21, 2018

Introduction

- Storytelling makes safety real and personal.
- Who is your audience? Safety professionals, work colleagues, students, the general public?
- What's the point of your story?
- The same story may have different points for different audiences.

When people hear your story,
they see your values.

John Donahue-Grossman

ODOR AS AN AID TO CHEMICAL SAFETY*

CHEMICAL	TLV (ppm)	AOT (ppm)
Acetone	750	13
Ammonia	25	5.2
Arsine	0.05	0.5
Carbon monoxide	50	100,000
Chlorine	1	0.31
Chloroform	10	10
Ethyl alcohol	1000	84
Ethyl ether	400	8.9
Hydrogen sulfide	10	0.008
Methyl alcohol	200	100
Methylene chloride	100	250
Naphthalene	10	0.084
Ozone	0.1	0.045
Phenol	5	0.04
Toluene	100	2.9
Vinyl chloride	5	3000
m-Xylene	100	1.1

Journal of Applied Toxicology, Vol. 3 (6), 1983

Professor Karen Wetterhahn



Professor Karen Wetterhahn

- Spent over 20 years in Dartmouth's Chemistry Department studying metal toxicology.
- In 8/96, while following standard safety protocol, she spilled a few drops of dimethyl mercury onto her latex glove.
- Five months later, curious health problems – impaired coordination, nausea, weight loss, and slurred speech. Acute Hg poisoning (80 times the toxic threshold) was to blame for these symptoms.

Karen Wetterhahn - 2

- The latex gloves she had worn were highly permeable to dimethyl mercury.
- Despite intense chelation therapy, her condition worsened rapidly. During 2/97, she fell into a coma.
- On June 8, 1997, Wetterhahn died at the age of 48.
- Lesson: new or familiar chemicals can be toxic!

September 11, 2001

- Safety education has no final exam.
- Evacuation issues.
- Danger of building collapse.
- Volunteers using PPE improperly.
- Respiratory problems in future years.

Sheri Sanji



Sheharbano (Sheri) Sangji

- Graduated with B.S. in chemistry from Pomona College in May 2008. Two published papers in peptide chemistry. Worked at Norac Pharma in Azusa, CA.
- Started work in Prof. Patrick Harran's lab at UCLA on Oct. 13, 2008. She missed the EH&S training and would have been expected to attend in January.
- On Oct. 17, she synthesized 3.6 g of 4-hydroxy-4-vinyldecane. The first step is a reaction of vinylbromide with two equivalents of tert-butyl lithium (tBuLi). In Dec., her goal was to generate three times as much product in a scaled up reaction.

Sheri Sangji -2

- Dec. 29, 2008 - Drawing up the tBuLi in a 60-ml plastic syringe, the plunger came out of the barrel, exposing the reagent to air. She knocked over an open flask of hexane in the hood. The tBuLi ignited and the solvent caught fire as did her clothes.
- The safety shower in the lab was not used. A post doc wrapped a lab coat around Sangji intending to put out the fire; the lab coat started burning. He then started pouring water on Sangji from a nearby sink, while she sat on the floor. She suffered second- and third-degree burns over 43% of her body.
- Sheri Sangji died on Jan. 16, 2009 at the age of 23.

Michele Dufault



Michele Dufault '11

- Astronomy and physics major at Yale. She was a member of the Yale Precision Marching Band and a Saybrugian.
- Member of the “Yale Drop Team” that performs reduced-gravity experiments with NASA programs.
- 2010 summer intern for Woods Hole Oceanographic Institute (MA) where she worked with scientists who design and operate robotic vehicles to make remote chemical and other measurements in the ocean.
- Feb. 2009 – participated in workshop to engage young girls to become interested in science.

Michele Dufault

- On April 13, 2011, Michele Dufault died in an accident in Sterling Chemistry Laboratory.
- An autopsy determined the cause of death to be “asphyxia due to neck compression.”
- While working in the machine shop, Michele’s hair got caught in a wood lathe. A lathe is a large machine that molds objects through use of a rotating mechanism.
- Other students working in the building found Dufault’s body and called the police around 2:30 a.m.

Quotes about Michele Dufault

- “an exceptional young woman, an outstanding student and young scientist, a dear friend and a vibrant member of this community.”
- “She was gifted in many areas not just science, she was a gifted musician, she was a gifted athlete and did crew, she was just a super talented kid just beyond belief, it’s a loss not only for her family but for the world.”

Quotes about Michele Dufault 2

- “Dufault was an extraordinary young woman, one of the most precocious students who her teachers ever encountered. She was simply brilliant. Her mind, her sense of curiosity, her perceptiveness, her sensitivity, and her enjoyment of what she did were extraordinary. She was a true intellectual.”

Be a Good Storyteller

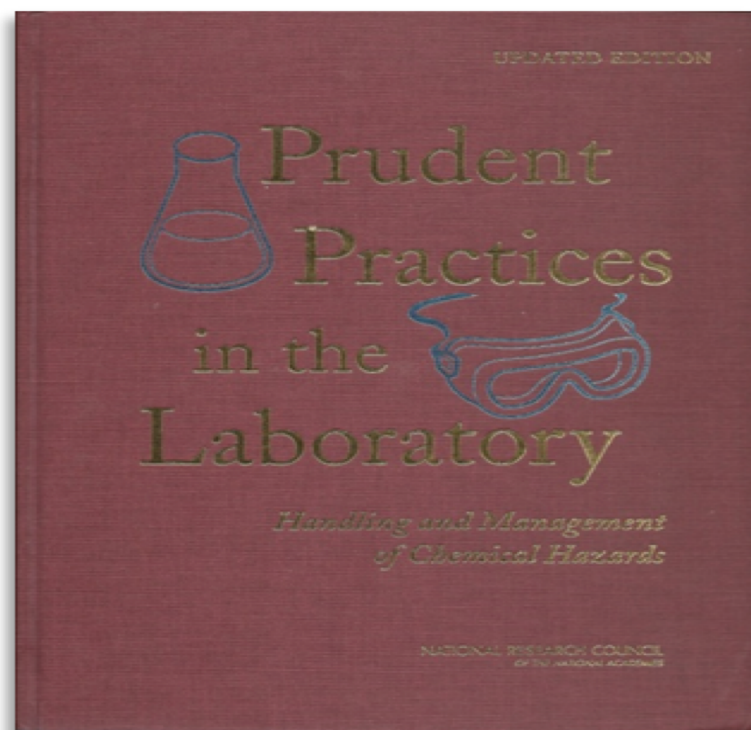
- Improve our storytelling skills.
- Recall our own experiences, both at work and off-the-job.
- Share stories that you have found to be effective in persuading others to work safely.
- *Chem. Health Safe.* **2003**, 10 (1), 56.

Most Successful Testimonies are Personal Stories of Consequences

- My chemistry TA
- “Room to Live”
- “Eye Safety”

Conclusions and Recommendations

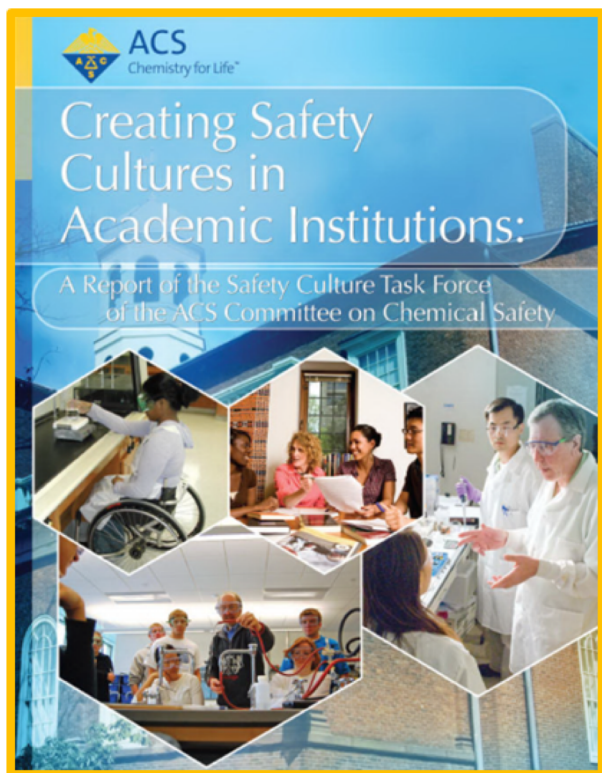
- Storytelling is a very effective way to communicate lab safety information.
- For a particular story, the point may vary depending on who is in your audience.
- Know what your point is for the particular audience.
- Emphasize your point. State it clearly.



Prudent Practices in the Laboratory (2011)

National Research Council, NAS. The standard publication in laboratory safety. Not limited to chemistry. Reference book rather than textbook. Electronic version available at no cost.

Safety is part of chemistry, just like atoms, elements, molecules, stoichiometry, reactions and kinetics. There is a special focus on safety in labs, but there is also a more universal concern about the effects of exposure to hazardous materials (e.g., HF, NH₃/NH₄OH, Cl₂, CO, CO₂, H₂S)



CREATING SAFETY CULTURES IN ACADEMIC INSTITUTIONS

ACS Committee on Chemical Safety; Safety
Culture Task Force – 57 pages - 2012

IDENTIFYING AND EVALUATING HAZARDS IN RESEARCH LABORATORIES

GUIDELINES DEVELOPED BY THE HAZARDS IDENTIFICATION AND EVALUATION TASK
FORCE OF THE AMERICAN CHEMICAL SOCIETY'S COMMITTEE ON CHEMICAL SAFETY



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