Lessons Learned From Incidents That Shaped My Passion for Safety

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#### THE CHAS Lifetime Achievement Award

- CHAS great, wonderful organization for me! Thankful to be CHAS Member
- Honored, Proud, Blessed to receive CHAS award.
- Made many friends knowing way more safety than I – Have learned a lot
- Hold my CHAS friends and colleagues in high esteem – Dedicated professionals making our world safer, more safety conscious

CONNECTING CHEMISTRY AND SAFETY

Looking forward to great future CHAS achievements – GO CHAS!!!

### Almost Killed

About 1960, riding with friends
In backseat behind driver
Having fun, laughing, talking
Driver didn't see stop sign
Until about to enter busy crossing road



### Almost Killed

- Swerved right into left lane, hit oncoming car on left front fender, Impact sprang open rear door
- Threw me out of car (no seat belt)
- Slid across road on my left side, stopping on road shoulder
- Car front wheel rolling directly at my head
- Stopped inches from my head and rolled back



### Almost Killed – What Happened?

Recognize hazards – no Uncontrolled car, momentum Distracted driver – age  $\approx$ 16 Distracting passengers (ages 13-15) Assess risks of hazards - no Minimize risks of hazards – no No seat belts in cars (required in1968) Prepare for emergencies – no

Almost Killed - Lessons Learned Any of us could be killed Can be killed by others risky behavior Teens especially susceptible to unrecognized hazards Unknowledgeable, Ignorant of surroundings, risky behaviors Often fail to think of consequences of actions Need education about hazards, risks, minimizing risks



# Almost Killed – Lessons Learned

- Distracted driving, cause of crashes >60 yrs ago
  - Distract driving #1 cause of crashes today
- Improved auto safety/teen driving laws reduced deaths
  - Crashes 5x higher in 1960 compared to today
  - Seat belts, air bags, cameras, danger alert signals, red light delays, guard rails
  - GA laws for 16-18 yrs only family allowed 1<sup>st</sup> six months (no peers); 2<sup>nd</sup> six months (1 peer only), driver education

- Excited to get job as a dry cleaner, age 17 or 18
- Training to explain job basics
  - What I am to do: Batch dry cleaning after spotting
  - Spotting area; how to operate dry cleaning machine, load, unload clothes to dryer
  - Nothing about hazards, safety precautions



- Large tank cylinder with inner drum with holes (6'x 3'd)
- Process:
  - Lift tank lid, open inner lid, spot clothes put in tank, close; activate cleaning cycle
  - Transfer to drying (clothes wet with solvent)



One day doing this got dizzy, wobbly, shaky, jittery, thought might pass out

- Went outside, sat on curb until feelings went away.
- Over-exposed Intoxicated by dry cleaning solvent (What it was?)



Tetrachloroethylene Exposure Limits
 OSHA TWA 100 ppm, Ceiling 200 ppm
 NIOSH IDLH 150 ppm



- Short-term exposure: impairment of coordination, dizziness, sleepiness, confusion, headache, respiratory irritation
- Chronic exposure: Neurological effects, potential carcinogen; liver damage

# Dry Cleaning Solvent Exposure – What Happened?

- Recognize hazards
  - No thought of cleaning hazards; No one trained or explained hazards (didn't know needed training)
  - Learned by experience fortunately no long lasting adverse effects
- Assess & Minimize risks of the hazards
  - Experiencing solvent exposure taught me its hazards, risks
  - Learned to minimize exposure via inhalation, skin
- Prepare for emergencies
  - Get away from source into fresh air

### A Shredding Experience

New job – College Lab Assistant, age 17
Given written reagent prep procedures
1<sup>st</sup> task: Prepare 12 N sodium hydroxide
Made in 2-liter beaker, pellets, water
Solution got very hot
Emitted fumes from surface



Conc NaOH, 2 L

# A Shredding Experience

- Next day mom washed my clothes
- When I got home she said:
  - "What did you do yesterday? Your clothes shredded in the washer!"
- Remembered lab work, did not wear lab coat (not provided)
- NaOH fumes destroyed fabric structure; washing revealed damage



# Workplace Toxic Exposures to Teens\*# Ages 14-19

- Adolescents occupational toxic exposures Unrecognized hazard ages 14 to 19\*
- Entry level jobs
- Most frequently involved agents: cleaning compounds, paints, solvents, glues, caustics, hydrocarbons, bleaches
- Texas Poison Centers<sup>#</sup> from 2000-2015, 2430 exposures (inhalation, dermal, ingestion, ocular) 23% serious
  - Males 18-19: 66% exposures
  - Inadequate ventilation; entering w/ improper or no PPE

\*Woolf AD, Flynn E. Arch Pediatr Adolesc Med, 154 (3), 234-239 (2000); Woolf A, Alpert HR, Garg A, ibid; 155 (6) 704-710 (2001)

#Ziqubu-Page T, Forrester MB; Int J Adolesc Med Health, 30 (3) 57 (2016)

LESSONS LEARNED - Dry Cleaning Solvent Exposure & Shredding Experience

- Young people, teens
   Excited to get job
  - Unlikely to ask questions about safety or hazards for new job
  - Adequate safety training likely missing



Know little safety; Susceptible to exposure, injury from unrecognized hazards

LESSONS LEARNED - Dry Cleaning Solvent Exposure & Shredding Experience

Parents & teachers need raise safety awareness in future jobs to students



- High school health courses cover important teen hazards, risks
- Likely not to include job hazards, risks
- Teach teens to ask about safety of new job
- Teaching use of RAMP as tool to help

National Institute for Occupational Health and Safety 1971-1979 IOSH U.S. Public Health Service Officer Learned a lot about occupational safety and health Occupational injuries, diseases, chemical exposures; Reported incidents, injuries, and deaths; Research chemist Developed methods measuring airborne exposures Collateral duty: 1<sup>st</sup> Lab Safety officer – branch, division Built my passion for workplace safety

### Centers for Disease Control and Prevention (CDC) – 1979 to 2005

- National Center for Environmental Health, Supervisory Research Chemist – 1979-1996
  - Developed methods measuring chemical exposures in human specimens
  - Involved in many incident investigations
- Office of Health and Safety Branch Chief, Assistant Director, Acting Director – 1996-2005
  - Oversaw safety programs for all CDC locations
  - Learning experience



CENTERS FOR DISEASE CONTROL AND PREVENTION

#### **Deciding To Make A Difference**

- Personal incidents, observations
- Recognizing lack of safety education
- Learning of injuries, incidents in labs, classrooms, workplaces
  - Virtually ALL preventable



- Human error maximized by ignorance, lack of caring for safety, risky behavior
- Didn't recognize, understand of hazards, their risks, ways to minimize risks, prepare for emergencies

### **Deciding To Make A Difference**

- Observations/Conclusions
  - Need to address widespread ignorance of safety, lack of caring about safety
  - Safety education needed
  - Safety not taught; Missing from curriculum
  - Needed new textbook on laboratory safety
  - Partnered with Dave Finster (met at CHAS meeting!!) for LSCS



### Getting to Young People

- Still concerned about safety education of young people – teens, college students
- Contact local public school system health education section?
- Discuss how RAMP can help youth understand
  - New way to think about personal safety (Safety not just set of rules)
  - Covers all hazards (not just lab hazards)

### Getting Young People to Think About Safety

- Teens likely to take any job to be found
  - Need to learn to ask questions about safety, hazards in new workplaces
  - RAMP teaches thinking about safety
- Incorporate RAMP into high school education simple concept easy to understand



Contact your public school system to introduce RAMP

Getting Young People to Think About Safety Develop RAMP Pamphlets, Posters for Teens Shows how to use RAMP Subjects – explaining hazards, risks New jobs & safety Other recognized teen hazards (driving, smoking, drinking, suicide, guns, drugs) Short, w/Incident stories Fact-filled with strategies to minimize risks

#### **Our Young People Need Safety Education**

We cannot eliminate risks, incidents, injuries in our world. But we can make a difference by reducing risks and preventing injuries if we teach students about safety. We must find ways to minimize ignorance of safety and promote caring for safety. Giving our students safety education in their teen, college years will make their world a better place in the future. R.A.M.P. up for SAFETY