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  - Department of Labor
  - Georgia Poison Center

- No financial or organizational interests to disclose
Outline

1. Overview
2. Referrals for OSHA enforcement
3. Statistical analysis of exposure data
Part 1: Overview
National Surveillance of Occupational Poisonings and Toxic Exposures?
Occupational Safety and Health Administration (OSHA)

- Created in 1970.
- Part of the Department of Labor.
- Mission:

  “To assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.”
OSHA Region IV

Source: www.osha.gov
Georgia Poison Center (GPC)

Established 1970.
Affiliated with Grady Health System and Emory University.
Receives > 100,000 calls/year.

Source: www.georgiapoisoncenter.org
Collaboration between Georgia Poison Center and OSHA Atlanta Regional Office

- Goal: Partnership to improve worker health
- Memorandum of understanding signed July 2014
- GPC began collecting additional data
  - Industry, Occupation, Employer
- Forwarded occupational exposure cases to OSHA
  - Only when able to obtain permission

Source: Gaylord Lopez
Occupational Surveillance: 3 Questions

* What is patient's occupation? lab tech

* Does caller permit us to share this info anonymously with OSHA to allow them to investigate and try to prevent this from happening again? Yes

* Did you send case info by text to Administrator on call? True False
Part 2: OSHA Referrals
OSHA enforcement referrals
(as of January 2016)

952 occupational exposure calls

544 (57%) unable to request permission

314 (33%) caller refused

94 (10%) referred to OSHA

Source: Gaylord Lopez
OSHA referral results (to date)

- **94 cases referred to OSHA**
  - **13 (14%) OSHA inspected and cited**
  - **13 (14%) OSHA investigated via phone/fax**
  - **52 (55%) OSHA did not investigate**
  - **6 (6%) OSHA already involved**
  - **10 (11%) OSHA inspected, in compliance**

Source: Gaylord Lopez
Enforcement case example

• Employer: Apartment management company with multiple locations in Southeast U.S.

• Pool chemicals (granulated calcium hypochlorite) fell onto a maintenance worker.

• Hospitalized with respiratory distress and severe chemical burns to eyes and skin.

• Georgia Poison Center contacted OSHA.

Source: Gaylord Lopez
Enforcement case (continued)

- OSHA inspected and found:
  - Lack of hazard communication program.
  - No quick drench shower/eyewash.
  - Improper storage of chemicals.
  - Hospitalization not reported to OSHA.

- Serious citations issued, with $13,150 in penalties.

- Hazards have been abated by the company.
  - 149 employees now enjoy a safer workplace.

Source: Gaylord Lopez
Conclusions I

• Benefits to workers:
  – Improved workplace safety.
  – Knowledge of OSHA protections and workers’ compensation system.

• Benefits to Georgia Poison Center:
  – Educational opportunities for toxicology and pharmacology fellows.
  – Improved data collection procedures.
  – Aligns with their mission of protecting public health.

• Benefits to OSHA Region IV:
  – New source of referrals.
  – Expertise of poison center fellows during inspections.
  – Improved knowledge of exposure scenarios in Georgia.

Source: Gaylord Lopez
Part 3: Statistical Analysis of Exposure Data
Data sharing by Georgia Poison Center

- In January 2016, the agreement was extended to include the OSHA National Office in Washington, DC.

- Georgia Poison Center shared the entire occupational exposure database for research purposes.

- Data were provided free of charge.
Coded fields in NPDS database

- Substance (4-level hierarchy)
- Exposure location (home, work, etc.)
- Medical outcome severity
- Management site
- Many others...

* We also received free-text narrative information (in PDF files) for each call.
Summary Statistics

- July 1, 2014 to January 7, 2016

- 952 occupational exposure calls
  - 66% Males
  - 98% Adults

- Workers exposed to 217 different substances
  - Inhalation (43%) most common route

- Classification of medical outcome severity:
  - 1% “Major” (n=11)
  - 15% “Moderate” (n=140)
  - 73% “Minor/none” (n=698)
  - 11% “Unknown” or “lost to follow-up” (n=103)
## Characteristics of Events with “Major” Medical Outcomes

<table>
<thead>
<tr>
<th>Substance</th>
<th>Exposure calls, n</th>
<th>Clinical Effects</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen sulfide (H₂S)</td>
<td>4</td>
<td>Loss of consciousness</td>
<td>Two separate incidents. One in construction, one in asphalt refining. A fifth worker died.</td>
</tr>
<tr>
<td>Hydrofluoric acid (HF)</td>
<td>2</td>
<td>1 skin burn; 1 corneal ulcer</td>
<td>Workers were using HF to clean automobiles.</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>Various (burns, dysrhythmias)</td>
<td>Exposures included hot asphalt, welding, diquat, and acids/bases. Some outcomes were unrelated to the exposure.</td>
</tr>
</tbody>
</table>
Analysis of Hospitalization Reporting
OSHA Recordkeeping: Reporting of Hospitalizations

70 cases with recorded “hospitalization”

67 (96%) did not meet reporting criteria:
- 29 not hospitalized
- 31 less than 24 hours
- 6 before January 1, 2015
- 1 outside OSHA jurisdiction

3 (4%) confirmed hospitalizations > 24 hours with mandatory OSHA reporting
OSHA Recordkeeping: Reporting of Hospitalizations

3 cases with mandatory OSHA reporting

2 (67%) found in OSHA database

1 (33%) apparent reporting violation
Analysis of Selected Substances
Methylene chloride

- OSHA National Office

\textit{a priori} interest

- Only 2 minor exposures reported to Georgia Poison Center during study

- Neither was related to bathtub refinishing

Image source: OSHA
<table>
<thead>
<tr>
<th>Generic Name</th>
<th>N</th>
<th>Major</th>
<th>Moderate</th>
<th>Minor/None</th>
<th>Unknown/Not Followed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals, NOS</td>
<td>60</td>
<td>0 (0)</td>
<td>12 (20)</td>
<td>40 (66.7)</td>
<td>8 (13.3)</td>
</tr>
<tr>
<td>Alkalis (excluding cleaning agents)</td>
<td>50</td>
<td>0 (0)</td>
<td>10 (20)</td>
<td>33 (66.0)</td>
<td>7 (14.0)</td>
</tr>
<tr>
<td>Bleaches</td>
<td>45</td>
<td>0 (0)</td>
<td>6 (13.3)</td>
<td>36 (80.0)</td>
<td>3 (6.7)</td>
</tr>
<tr>
<td>Other Types of Acid</td>
<td>36</td>
<td>1 (2.8)</td>
<td>5 (13.9)</td>
<td>25 (69.4)</td>
<td>5 (13.9)</td>
</tr>
<tr>
<td>Industrial Cleaners: Alkalis</td>
<td>35</td>
<td>0 (0)</td>
<td>8 (22.9)</td>
<td>22 (62.9)</td>
<td>5 (14.3)</td>
</tr>
<tr>
<td>Chlorine Gas</td>
<td>30</td>
<td>0 (0)</td>
<td>3 (10.0)</td>
<td>25 (83.3)</td>
<td>2 (6.7)</td>
</tr>
<tr>
<td>Other Non-Drug Substances</td>
<td>25</td>
<td>0 (0)</td>
<td>2 (8.0)</td>
<td>22 (88.0)</td>
<td>1 (4.0)</td>
</tr>
<tr>
<td><strong>Unknown fume/gas/vapor</strong></td>
<td>20</td>
<td>0 (0)</td>
<td>10 (50.0)</td>
<td>10 (50.0)</td>
<td>3 (15.0)</td>
</tr>
<tr>
<td>Ethylene Glycol (automotive)</td>
<td>18</td>
<td>0 (0)</td>
<td>1 (5.6)</td>
<td>14 (77.8)</td>
<td>3 (16.7)</td>
</tr>
<tr>
<td>Ammonia</td>
<td>17</td>
<td>0 (0)</td>
<td>2 (11.8)</td>
<td>12 (70.6)</td>
<td>3 (17.6)</td>
</tr>
<tr>
<td><strong>Carbon Monoxide</strong></td>
<td>17</td>
<td>0 (0)</td>
<td>3 (17.6)</td>
<td>11 (64.7)</td>
<td>3 (17.6)</td>
</tr>
<tr>
<td>Hydrofluoric Acid</td>
<td>17</td>
<td>2 (11.8)</td>
<td>3 (17.6)</td>
<td>13 (76.5)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
Unknown fumes/gases/vapors

- 15 of the 20 calls resulted from a single incident
- Forklift operator punctured a barrel at a waste recycling facility
- Multiple co-workers hospitalized overnight with respiratory symptoms
Carbon monoxide

- Number of cases: 17
- Industry/occupation:
  - 3 using gas-powered cement cutters/grinders indoors
  - 3 truck drivers
  - 2 food truck workers using portable generators
- Most common outcomes:
  - 12 with headache and/or nausea
  - 2 with loss of consciousness
  - 1 altered mental status
Case 2: Carbon monoxide

- ED physician called GPC at 2:53 p.m.
- 66 yo male was operating a gas-powered cement cutter indoors
- Found unconscious by a co-worker
- Upon ED arrival, awake but drowsy.
- Initial carboxyhemoglobin level 34.
- Admitted to hospital, doing better at time of last GPC follow-up (11:17 a.m. next day)
**Carbon Monoxide Poisoning**

**Gas-Powered Generators, Tools and Other Equipment**

**Are you in danger?**

If you are using...

- A gas-powered generator indoors, in a semi-enclosed area, in a sheltered outdoor location, or outside near an air intake.
- Or any gas-powered tool, such as walk-behind or hand-held concrete cutting saws, power trowels, water pumps, or pressure washers, indoors or in a sheltered outdoor location...

...then the answer is **YES**.

You could die from carbon monoxide (CO) poisoning.

**Carbon monoxide (CO) is a silent killer.**

It is odorless and colorless.

You can only detect it with a carbon monoxide monitor.

**Know the basics...**

1. **Use generators outside**
   
   NEVER use gas-powered generators or compressors inside a building or in a semi-enclosed outdoor space. Locate them as far as practical from any occupied building.*

   *Generators should be outdoors, preferably 25 feet downwind from an occupied building as recommended by the National Institute of Standards and Technology.

2. **Use gas-powered tools outside**

   DON'T use gas-powered tools indoors. These tools include gas-powered concrete saws, pressure washers, water pumps, and power trowels.

   Carbon monoxide concentrations reached the NIOSH warning level of 100 parts per million within 3 minutes using a 6.5 HP pressure washer in a double-car garage with both doors and a window open.

3. **Know other CO hazards and controls**

   - Fuel-powered forklifts can cause CO poisoning indoors. Avoid letting engines idle. Consider asking for CO badges that alert when levels get too high.
   - Fuel-fired heaters (salamander or torpedo heaters) can produce CO. Make sure the unit is designed for indoor use and keep a CO monitor nearby.
   - If you are MIG welding using carbon dioxide (CO2) shielding gas, make sure you have local exhaust ventilation (LEV) with hood positioned correctly. CO2 can be changed into CO in the hot arc of welding.

**If you find a co-worker down...**

- Shut off the engine, if you can
- Call 911
- Don't enter the area

Workers have died trying to save others.

Any indoor use of gas-powered generators or tools should be approved by a competent person who must evaluate factors such as size of the space and whether ventilation can effectively reduce CO levels. The competent person should conduct air monitoring during the work to be sure the ventilation is doing its job. This type of use should be rare and occur only on large projects, like indoor stadium construction. NEVER in residential construction.

**Find out more about construction hazards.**

Get more of these Hazard Alert cards and cards on other topics.

Call 301-578-8500

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Hydrofluoric acid

- Number of cases: 17
- Industry/occupation:
  - 10 of 17 worked in auto cleaning/detailing
  - 3 were researchers or lab technicians
- Most common outcomes:
  - 11 with dermal burns or skin pain
  - 3 with respiratory irritation
  - 2 with eye symptoms
Case 3: Hydrofluoric acid

- Mother called poison control at 4:31 p.m.
- 14-year-old son was working at a car detailer earlier that morning
- Cleaning chemical ate through his shoe
- Top of foot red/blistered/painful
- Later that evening, GPC followed up
  - Co-worker sprayed the chemical on his bare arm to “prove” it was not an acid
Conclusions
Benefits to OSHA and DOL

- Identification of new exposures/industries that previously were not priorities for OSHA National Office
  - Hydrofluoric acid in car detailing
  - Carbon monoxide from indoor use of gas-powered tools

- Future Hazard Alerts or Special Emphasis Programs?

- Identification of recordkeeping violations

- Awareness of hazards in youth labor
Safety Issues Identified

- Pesticides in unlabeled containers
- Improper or defective PPE
- Lack of Hazard Communication training
- Improper storage of chemicals
- Faulty/inoperative sensors (CO and H₂S)
- Others...
Opportunities for Improvement

• Industry/occupation is not coded (free-text only)
  – Ask NPDS to include these fields in its standard...
  – NIOSH auto-coder (NIOCCS)...

• Low permission rate for OSHA referrals...
All AAPCC member poison centers upload data to NPDS every 8 minutes, providing a near real-time snapshot of poison call conditions nationwide.

Source: AAPCC/NPDS
Future Directions

• OSHA and Georgia Poison Center plan to continue this collaboration.

• Make NPDS and other poison control centers aware of the value of this type of partnership.
  - NIOSH/OSHA joint presentation at AAPCC Mid-Year Directors’ Meeting, February 2016

• Possible collaborations with other agencies...
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References


Thank You