Marijuana
Public and Occupational Health Issues

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Goals

- Identify EHS issues in the marijuana industry
- Provide guidance to marijuana industry to prevent occupational injuries and illnesses
- Provide guidance to marijuana industry on hazardous waste and sustainability issues
- Surveillance data to follow injury and illness trends
- Others?
Only section that directly specifies CDPHE. Several duties outlined:

a. "Monitor changes in drug use patterns, broken down by county and race and ethnicity, and the emerging science and medical information relevant to the health effects associated with marijuana use.”
b. "The Department shall appoint a panel of health care professionals with expertise in cannabanoid physiology to monitor the relevant information. The panel shall:

- Provide a report by 1/31/15 and every 2 years thereafter*
- Establish criteria for 1) studies to be reviewed, and 2) reviewing studies and other data*, and
- Make recommendations, as appropriate, for policies intended to protect consumers of marijuana or marijuana products and the general public*.

*No required duties until we have funding
FAKE POT
REAL DANGER

SMOKING SYNTHETIC MARIJUANA, LIKE SPICE AND K2, HAS LED TO MORE THAN 200 HOSPITALIZATIONS IN COLORADO IN TWO MONTHS. THERE IS A BAD BATCH ON THE STREETS. YOU DON'T KNOW WHAT'S IN IT.
Legal Marijuana and Public Health

- Monitor health effects
  - Changes in use
  - Accidents
  - Poisonings
  - Chronic health issues

- Education and Prevention
  - Adolescent use
  - Pregnant or nursing mothers
  - Product safety and storage
  - Harm reduction
  - Occupational health and safety

- Infused product safety
- Laboratory practices
- Waste disposal
Governance of Recreational Marijuana-Related Activities at the Colorado Department of Public Health and Environment (CDPHE)

Recreational Marijuana Steering Committee (internal)*

*Co-chaired by CDPHE’s Deputy CMO and Chief of Toxicology, Environmental/Occupational Epidemiology; With representatives from all divisions on this chart

Internal committee coordinates all of CDPHE’s diverse responsibilities related to recreational marijuana

Collecting and analyzing data on prevalence of marijuana use

Clean Indoor Air Act issues; if designated, may do prevention education or campaigns

Surveillance for health effects & outbreaks; compile medical literature & safety info

Consultative role on developing lab regulations; lab certification

Consultative role on issues related to the safety of edibles

Consultative role on issues related to marijuana disposal

Center for Health and Environmental Information and Statistics (CHEIS)

Preventive Services Division (PSD)

Disease Control and Environmental Epidemiology Division (DCEED)

Laboratory Services Division (LSD)

Division of Environmental Health & Sustainability (DEHS)

Hazardous Waste and Waste Management Division (HWWMD)
Data and Surveillance Tools

- Death Certificates
- Hospitalization Records
- Emergency Department Visits
- Emergency Medical Services Response
- Healthy Kids Colorado Survey (aka YRBS)
- Behavioral Risk Factor Surveillance System (BRFSS)
- Tobacco Attitudes and Behaviors Survey (TABS)
- Pregnancy Risk Assessment Monitoring System (PRAMS)
- Problem Identification Report with CDOT
- All Payer Claims Database
- Adding marijuana as a reportable condition (possible)
Potential Collaborators

- Rocky Mountain Poison and Drug Center
- Pediatric Environmental Health Specialty Unit (PEHSU)
- CU/Denver Health Toxicologists
- Pharmacology
- Denver/Colorado Epidemiology Work Groups
- Children’s Hospital
- ER Physicians
- Substance Abuse/Addiction Medicine
- Others??
Possible Research

- Using medical marijuana surplus from registration fees:
  - may conduct clinical/observational research related to medical marijuana
  - Possible clinical trials
Preventing Negative Health Outcomes

- Submitted supplemental budget request to address:
  - Adult abuse prevention,
  - Prevention of use during pregnancy/breastfeeding,
  - Secondhand smoke prevention,
  - Identification of high risk populations through surveillance to target with messaging.
Educate on Appropriate Retail Use

• Campaign will also provide:
  – Education about the law to retailers and users
  – Emphasis on restricting youth access
  – Reinforce Clean Indoor Air Act (CIAA)

• CDPHE staff will coordinate response to CIAA complaints
More Resources

www.colorado.gov/cdphe/marijuana
www.learnaboutmarijuanawa.org
www.drugabuse.gov
EHS and the Marijuana Industry

- Employee and employment issues
- Current Colorado rules
- Potential H&S issues
Employer/Employee Issues

- Covered by OSHA
- Must follow Colorado labor laws
- Employees must have “Occupational License”
  - Apply thorough DOR
    - 21 years old
    - Pass criminal background check
    - Prove Colorado residency
Colorado Rules

• Enforcement through the Colorado Department of Revenue (1 CCR 212-2)
• Specific environmental, health, and safety rules
  – Retail Marijuana Store
  – Retail Marijuana Cultivation Facility
  – Retail Marijuana Products Manufacturing Facility
  – Retail Marijuana Testing Facility
Common Requirements

• Required to comply with local codes
• Sanitation
• Employee training
• Access control
• Security
  – Alarms
  – Locks
  – Video surveillance
Cultivation Facilities

• Pesticide/Ag Chemical requirements
  – SOPs
  – MSDS/Labeling
  – Comply with Pesticide Applicators Act
  – Long list of prohibited chemicals
Product Manufacturing Facilities

- Food safety training
- Concentrate manufacturing requirements
  - Written procedures
  - Only butane, propane, CO2, ethanol, isopropanol, acetone, and heptane allowed
  - Closed loop only – except for ethanol and isopropanol
  - IH Evaluation
    - Quantities
    - Electrical issues
    - Monitoring
    - Fire suppression
    - Ventilation
    - PPE
Study Goals

• Examine 15-20 MGOs during law enforcement entry
• Determine the exposures associated with the investigation of MGOs
• Determine the potential adverse health effects to first responders and children
• Suggest appropriate PPE for first responders
Growing Marijuana 101

- High temperature
  - 71° to 88° F
  - Optimum as high as 95° F
  - Excess heat vented outside
- High relative humidity
  - 50%-70%
- High intensity lighting
  - 2,000 lumens/ft²
  - Controlled photoperiod
- Elevated carbon dioxide
  - 700 to 1500 ppm
- Frequent fertilization
- Pest control (mites & fungi)
Potential Health Hazards of Marijuana Grow Operations

- **Outdoors: Low Hazard**
  - Pesticide and fertilizer application
  - Harvesting/seizing operations

- **Greenhouse grow ops**
  - Hazards similar to outdoor operations
  - Moisture resistant structure
  - Adequate ventilation
  - Professional electrical installation
Potential Health Hazards of Indoor Marijuana Grow Operations

- Concealed operation
- Inadequate ventilation
- Excessive moisture
- Makeshift carbon dioxide concentrator
- Improper electrical installation
- Limited knowledge of safe pesticide and fertilizer handling
- Growers and family live in house
Exposure Concerns

- High humidity and warm temperatures
  - Mold/Fungi
  - Endotoxin
- Elevated combustion pollutants
  - Carbon dioxide
  - Carbon monoxide
  - Oxides of nitrogen (NO\textsubscript{x})
- Pesticides
- Irritant chemicals
  - Volatile Organic Compounds (VOCs)
- High levels of solvents (extraction processes)
- Airborne and surface THC
- Electrical hazards
Electrical Hazards
THC Exposures

- Most surfaces in IMGO’s were contaminated with measurable levels of THC
- Handling plants resulted in as much as 2900 µg/wipe on hands
  - Below levels associated with “high”
- No measurable airborne THC
Other Chemical Exposures

- Low level exposure to terpenes
  - ppb level
  - Below levels associated with chronic health effects
  - May cause irritation symptoms
  - Very strong odors

- No extraction operations observed
Pesticide Exposures

- Little evidence of significant pesticide use
- Limited use of pyrethrin based insecticides
  - All air samples we collected were non-detect
- Some of the pesticides were listed for outside use only. ("Not for residential use")
Combustion Exposures

- **Carbon dioxide**
  - Normal outdoor level: 350-450 ppm
  - OEL: 5,000 ppm
  - Highest we have seen: 1400 ppm

- **Carbon monoxide**
  - Average in homes with gas stoves: 0.5-5 ppm
  - EPA Limit: 9 ppm
  - Highest we have seen: 0.8 ppm

- **NOx:**
  - Non-detect in MGOs

Many MGOs had combustion powered CO₂ generators!
Mold/Fungi Exposures

- In 21/30 (70%) MGOs, mold at levels classified as “IAQ problem”
- During tear-out 6/10 (60%) MGOs mold increased compared to initial samples

Mold levels during plant removal activities were similar to those that would be expected during a medium size mold remediation job.
Conclusions

- Significant mold exposure hazard at most MGOs
  - Allergic symptoms, asthma exacerbation, special considerations for immunosuppressed individuals
- Combustion pollutants were not a significant issue in Colorado MGOs, but remain an acute exposure concern.
- Pesticide use in Colorado MGOs was very limited
- Significant potential for irritation symptoms from volatile organic compounds
- Most surfaces in an MGO are contaminated with significant levels of THC
- Use of respiratory protection and gloves is an important practice for investigators
Contact

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Referrals
ToxCall (303) 692-2700
CDPHE_ToxCall@state.co.us
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Outputs

• Report
  - Lit review
  - Hazard ID

• Tools
  - Example programs
  - FAQs
  - Best practice guidelines
  - Small business guide
Approach

• Workgroups?
  - Safety and Security
  - Wellness and Safety Culture
  - Health (IH)
  - Waste and Sustainability
  - Existing knowledge (resources, lit review, data)
  - Employer policies regarding marijuana??
  - Nuisance odor issues??
Site Visits

• Number of facilities?
• Types of facilities?
• Field team?
• Reports back to larger group?
• Possible exposure monitoring?
• Scheduling?
Timeline

• Meeting frequency?
• Information sharing?
• Email list?
• Deadline?
Dissemination

- CDPHE?
- Dedicated web page?
- Industry meetings?
- NIOSH/OSHA?
- Insurers?