Montana Poison Center Introductions

- Shireen Banerji, PharmD, Managing Director
- Christopher Hoyte, MD, Medical Director
- Brandon Ensign, MBA, Director, Med Info
What is Rocky Mountain Poison & Drug Safety (RMPDS)?

- Medical Management
- Toxicology Consulting
- Research
- Product Information
- Analytics
- Administrative Support
- Pharmaco-vigilance

ROCKY MOUNTAIN POISON & DRUG SAFETY
Saving lives with answers.™

MONTANA POISON CENTER 1-800-222-1222 POISONHELP.ORG
Rocky Mountain Poison Center
Service Region

- Poison Center
- Poison Center that serves other States
- State that does not have a Poison Center and is served by another State

Refer to the information below for detailed coverage information.
Montana Poison Center Overview

- One of the largest certified Poison Centers
- 24 x 7 service, 365 days
- Staffed by Specialists in Poison Information (SPI)
- Disaster Recovery System
- Core Competency
  - Medical Management of Poisonings/Exposures
- Caller Types
  - General public
  - Healthcare professionals
  - Persons in the workplace
  - Public Health
  - Law Enforcement
- Omni-channel capabilities (phone, SMS, web chat, email)
Montana Poison Center

• **Staff**
  - CSPI/SPI: [Certified] Specialists in Poison Information manage all healthcare and public exposure calls.
    - RNs, PharmDs (n=22)
    - 68% CSPI Staff as of July 2023
  - PIP: Poison Information Providers manage low acuity calls
    - Para-professionals

• **Backup support**
  - Medical Toxicology (physician) fellows & board-certified Medical Toxicologists
  - Clinical Toxicologists
  - Medical Director
Montana PC Case Volume: 2000-2022

- Animal Exposures
- Human Exposures
- Information Calls
- HCF Cases

13% of all calls

192% Increase, 31% of all calls
### Montana PC: 2022 Case Breakdown

<table>
<thead>
<tr>
<th>Case Type</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposures</td>
<td>7,446</td>
</tr>
<tr>
<td>Drug identification</td>
<td>110</td>
</tr>
<tr>
<td>Poison information</td>
<td>38</td>
</tr>
<tr>
<td>Caller Referred</td>
<td>56</td>
</tr>
<tr>
<td>Other information</td>
<td>22</td>
</tr>
<tr>
<td>Drug information</td>
<td>60</td>
</tr>
<tr>
<td>Administrative</td>
<td>1</td>
</tr>
<tr>
<td>Prevention / Safety / Education</td>
<td>6</td>
</tr>
<tr>
<td>Environmental information</td>
<td>5</td>
</tr>
<tr>
<td>Medical information</td>
<td>4</td>
</tr>
<tr>
<td>Occupational information</td>
<td>1</td>
</tr>
</tbody>
</table>
Montana PC: 2022 Exposures by County

Legend:
- 0 - < 1 case
- 1 - < 10 cases
- 10 - < 70 cases
- 70 - < 300 cases
- 300 - < 1,000 cases
- 1,000 - < 4,000 cases

The map highlights the counties with the highest number of exposures, with a focus on the counties in the central part of the state.
# Montana PC: 2022 Exposures by County

<table>
<thead>
<tr>
<th>County</th>
<th># Exposures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaverhead</td>
<td>52</td>
</tr>
<tr>
<td>Big Horn</td>
<td>93</td>
</tr>
<tr>
<td>Blaine</td>
<td>58</td>
</tr>
<tr>
<td>Broadwater</td>
<td>25</td>
</tr>
<tr>
<td>Carbon</td>
<td>64</td>
</tr>
<tr>
<td>Carter</td>
<td>9</td>
</tr>
<tr>
<td>Cascade</td>
<td>581</td>
</tr>
<tr>
<td>Chouteau</td>
<td>19</td>
</tr>
<tr>
<td>Custer</td>
<td>71</td>
</tr>
<tr>
<td>Daniels</td>
<td>6</td>
</tr>
<tr>
<td>Dawson</td>
<td>59</td>
</tr>
<tr>
<td>Deer Lodge</td>
<td>62</td>
</tr>
<tr>
<td>Fallon</td>
<td>19</td>
</tr>
<tr>
<td>Fergus</td>
<td>45</td>
</tr>
<tr>
<td><strong>Flathead</strong></td>
<td><strong>783</strong></td>
</tr>
<tr>
<td>Gallatin</td>
<td>723</td>
</tr>
<tr>
<td>Garfield</td>
<td>4</td>
</tr>
<tr>
<td>Glacier</td>
<td>156</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>County</th>
<th># Exposures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granite</td>
<td>14</td>
</tr>
<tr>
<td>Hill</td>
<td>142</td>
</tr>
<tr>
<td>Jefferson</td>
<td>47</td>
</tr>
<tr>
<td>Judith Basin</td>
<td>8</td>
</tr>
<tr>
<td>Lake</td>
<td>170</td>
</tr>
<tr>
<td>Lewis And Clark</td>
<td>516</td>
</tr>
<tr>
<td>Liberty</td>
<td>12</td>
</tr>
<tr>
<td>Lincoln</td>
<td>128</td>
</tr>
<tr>
<td>Madison</td>
<td>37</td>
</tr>
<tr>
<td>Mccone</td>
<td>5</td>
</tr>
<tr>
<td>Meagher</td>
<td>10</td>
</tr>
<tr>
<td>Mineral</td>
<td>44</td>
</tr>
<tr>
<td><strong>Missoula</strong></td>
<td><strong>802</strong></td>
</tr>
<tr>
<td>Musselshell</td>
<td>19</td>
</tr>
<tr>
<td>Park</td>
<td>106</td>
</tr>
<tr>
<td>Petroleum</td>
<td>4</td>
</tr>
<tr>
<td>Phillips</td>
<td>15</td>
</tr>
<tr>
<td>Pondera</td>
<td>29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>County</th>
<th># Exposures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder River</td>
<td>5</td>
</tr>
<tr>
<td>Powell</td>
<td>63</td>
</tr>
<tr>
<td>Prairie</td>
<td>4</td>
</tr>
<tr>
<td>Ravalli</td>
<td>295</td>
</tr>
<tr>
<td>Richland</td>
<td>48</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>65</td>
</tr>
<tr>
<td>Rosebud</td>
<td>58</td>
</tr>
<tr>
<td>Sanders</td>
<td>61</td>
</tr>
<tr>
<td>Sheridan</td>
<td>19</td>
</tr>
<tr>
<td>Silver Bow</td>
<td>268</td>
</tr>
<tr>
<td>Stillwater</td>
<td>46</td>
</tr>
<tr>
<td>Sweet Grass</td>
<td>11</td>
</tr>
<tr>
<td>Teton</td>
<td>33</td>
</tr>
<tr>
<td>Toole</td>
<td>13</td>
</tr>
<tr>
<td>Treasure</td>
<td>4</td>
</tr>
<tr>
<td>Valley</td>
<td>39</td>
</tr>
<tr>
<td>Wheatland</td>
<td>21</td>
</tr>
<tr>
<td>Wibaux</td>
<td>2</td>
</tr>
<tr>
<td><strong>Yellowstone</strong></td>
<td><strong>1,151</strong></td>
</tr>
</tbody>
</table>
## Top 10 Exposures

### Montana Poison Center 2022

<table>
<thead>
<tr>
<th>Substance</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesics (OTC &amp; Rx)</td>
<td>15.23</td>
</tr>
<tr>
<td>Household cleaners</td>
<td>6.95</td>
</tr>
<tr>
<td>Cosmetics/personal care</td>
<td>5.44</td>
</tr>
<tr>
<td>Sedatives, hypnotics, antipsychotics</td>
<td>5.40</td>
</tr>
<tr>
<td>Cardiovascular drugs</td>
<td>5.31</td>
</tr>
<tr>
<td>Dietary supplements/herbals/homeopathic remedies</td>
<td>4.34</td>
</tr>
<tr>
<td>Alcohols</td>
<td>3.60</td>
</tr>
<tr>
<td>Foreign bodies/toys</td>
<td>3.28</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>2.79</td>
</tr>
<tr>
<td>Plants</td>
<td>2.77</td>
</tr>
</tbody>
</table>
## Top 10 Exposures (Age ≤ 5 yrs)

### Montana Poison Center 2022

<table>
<thead>
<tr>
<th>Substance</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesics</td>
<td>14.13</td>
</tr>
<tr>
<td>Cosmetics/personal care</td>
<td>9.33</td>
</tr>
<tr>
<td>Household cleaners</td>
<td>9.02</td>
</tr>
<tr>
<td>Dietary supplements/herbals/homeopathic remedies</td>
<td>8.44</td>
</tr>
<tr>
<td>Foreign bodies/toys</td>
<td>6.12</td>
</tr>
<tr>
<td>Vitamins</td>
<td>4.99</td>
</tr>
<tr>
<td>Topical preparations</td>
<td>4.44</td>
</tr>
<tr>
<td>Plants</td>
<td>4.16</td>
</tr>
<tr>
<td>Gastrointestinal preps</td>
<td>3.09</td>
</tr>
<tr>
<td>Pesticides</td>
<td>2.66</td>
</tr>
</tbody>
</table>
MT PC Exposures by Age, Gender: 2022

<table>
<thead>
<tr>
<th>AGE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 5 years</td>
<td>42.2</td>
</tr>
<tr>
<td>6 – 12 years</td>
<td>5.5</td>
</tr>
<tr>
<td>13 – 19 years</td>
<td>11</td>
</tr>
<tr>
<td>≥ 20 years</td>
<td>39</td>
</tr>
<tr>
<td>Unknown age</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>53.8</td>
</tr>
<tr>
<td>Male</td>
<td>44.7</td>
</tr>
</tbody>
</table>
Montana PC: Exposure Reasons

[Graph showing trends in unintentional, suspected suicide, and abuse exposure reasons from 2000 to 2022]
## Human Exposures: Medical Outcomes by Reason, Montana PC 2022

<table>
<thead>
<tr>
<th>Reason</th>
<th>Unintentional</th>
<th>Suspected Suicide</th>
<th>Abuse</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Effect</td>
<td>4430</td>
<td>303</td>
<td>19</td>
<td>55.4</td>
</tr>
<tr>
<td>Minor Effect</td>
<td>1642</td>
<td>550</td>
<td>81</td>
<td>26.5</td>
</tr>
<tr>
<td>Moderate Effect</td>
<td>243</td>
<td>364</td>
<td>54</td>
<td>7.7</td>
</tr>
<tr>
<td>Major Effect</td>
<td>10</td>
<td>40</td>
<td>12</td>
<td>0.7</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>Not followed</td>
<td>513</td>
<td>107</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Unrelated Effect</td>
<td>153</td>
<td>18</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Confirmed nonexposure</td>
<td>14</td>
<td>0</td>
<td>1</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Human Exposures: Disposition
Montana PC 2022

- Managed on site (non health care facility): 60%
- Patient already in (enroute to) HCF when PCC called: 31%
- Patient was referred by PCC to a HCF: 8%
- Other/Unknown: 1%
Human Exposures: Level of Care
Montana PC 2022

- Admitted to critical care unit: 3%
- Admitted to noncritical care unit: 12%
- Admitted to psychiatric facility: 7%
- Patient lost to follow-up / left AMA: 18%
- Patient refused referral / did not arrive at HCF: 1%
- Treated/evaluated and released: 57%
## Montana 2022 Human Fatalities

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Reason</th>
<th>Route</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>17y</td>
<td>M</td>
<td>Abuse</td>
<td>Ingestion</td>
<td>Molly</td>
</tr>
<tr>
<td>39y</td>
<td>M</td>
<td>Intentional</td>
<td>Ingestion</td>
<td>Meth Oxycodone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Misuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72y</td>
<td>M</td>
<td>Suicide</td>
<td>Ingestion</td>
<td>Polydrug</td>
</tr>
</tbody>
</table>
2022 RMPC Data Summary: Montana

17.8% were suspected suicides.

10.5% resulted in serious outcomes.*

0.04% (3) resulted in death.

91.5% occurred at a residence.

60.5% were managed on site.

30.6% cases originated from a Health Care Facility.

* serious outcomes are defined as Moderate effect, Major effect, Death or Death, Indirect.
Human Exposures: Drugs of Abuse
Montana PC 2022

![Graph showing human exposures to various drugs of abuse from 2018 to 2022. The y-axis represents the number of exposures, while the x-axis represents the years. The graph includes lines for Marijuana, Heroin, Cocaine, Meth, and Opioids. Each line shows a trend over the years.]

- Marijuana
- Heroin
- Cocaine
- Meth
- Opioids
Human Exposures: Marijuana
Montana PC 2022

- 51 Exposures (Age 0-5y = 19 exposures)
- Disposition
  - Managed on site: 22%
  - Already in hospital when PC called: 61%
  - PC referred to hospital: 14%
  - Lost to follow-up: 4%
- Outcomes
  - No effect: 27%
  - Minor effect: 41%
  - Moderate effect: 27%
  - Major effect: 0
  - Death: 0
  - Lost to follow-up: 4%
Human Exposures: Marijuana type
Montana PC 2022

- Marijuana flower (dried): 19
- Marijuana concentrate: 4
- Marijuana edibles: 22
- Marijuana unknown type: 1
- Cannabidiol (CBD): 4
- Marijuana e-cigarette: 1
Human Exposures: Rx Opioids
Montana PC 2022

• 143 Exposures
  • Disposition
    • 131 managed in health care facility (91.6%)
    • 11 managed on site (7.7%)
  • Reason
    • Intentional:  92 (64.3%)
    • Unintentional:  47 (32.9%)
    • Unknown:  4 (2.8%)
Human Exposures: Rx Opioids
Montana PC 2022

• Medical Outcomes
  • No effect: 25.2%
  • Moderate: 32.2%
  • Lost to follow-up: 2.1%

• Minor: 28.7%
  • Major: 9.1%
  • Death: 0.7%
Most frequent products reported

- Hydrocodone (34) or oxycodone (15) + acetaminophen, oxycodone single ingredient (25), fentanyl (19), tramadol (17), buprenorphine (15), methadone (5)

- Naloxone given in 40 cases (28%)
Clinical and Medical Services
"Pharm Party"

Major local effort launched to educate seniors and stem flow of unused medications

- 2.7 million children between ages 12-17 who have abused prescription drugs
- 10% of high school seniors who have abused narcotics
- 11% of high school seniors who have abused tranquilizers
- 17% of high school seniors who have abused amphetamines

Source: National Household Survey on Drug Abuse
Toxidromes

- Opioid
- Anticholinergic
- Sympathomimetic
- Serotonergic
- Cholinergic Crisis
Case

- 12-year-old male presents to the ED after being found unresponsive and being brought in from a “pharm party”. He is cyanotic, does not arouse to verbal or physical stimuli, has decreased bowel sounds, and miosis.

- HR 65  BP 97/63  RR 4  Temp 35.0°C

- Pulse ox 71%
Hint(s)

- China Waterhorse
- Hell dust
- Skag
- Apache
- King Ivory
- Tango and Cash
Opioid toxidrome
Opioids

- Respiratory depression
- CNS depression
- QT interval prolongation (methadone)
- Seizures (tramadol)
- Naloxone
- Intubation
Figure 2. National Drug-Involved Overdose Deaths*, Number Among All Ages, 1999-2021

- Synthetic Opioids other than Methadone (primarily fentanyl)
- Psychostimulants with Abuse Potential (primarily methamphetamine)
- Cocaine
- Prescription Opioids (natural & semi-synthetic opioids & methadone)
- Benzodiazepines
- Heroin
- Antidepressants
OxyContin® II
(oxycodone hydrochloride)
extended-release tablets

80 mg

100 Tablets  Rx Only

Attention Dispenser: Accompanying Medication Guide must be provided to the patient upon dispensing.

NDC 59011-480-10

Swallow tablets whole. Do not cut, break, chew, crush, or dissolve.

For use in opioid-tolerant patients only.
**Synthetic Fentanyl Derivatives**

- Carfentenil
- Remifentanil
- Sufentanil
- Theft from veterinarian offices
- 10,000X more potent than morphine, 100X more potent than fentanyl
- Opioid toxicity
- Respiratory depression
- Death
Tranq Dope

Fentanyl

- analgesic
- mu opioid receptor agonist
- Rapid onset, short duration
- **AMS, miosis, respiratory depression,** decreased bowel sounds
- High addiction potential
- Current epidemic
- Patches, pills, liquid, lollipops

Xylazine

- Centrally acting α-2 receptor agonist (like clonidine)
- Veterinary medicine, large animal and game tranquilizer
- AMS (sedation), hypotension, bradycardia
Tranq Dope Mechanisms of Toxicity

Fentanyl

Xylazine

[Diagram of tranq dope mechanisms]
10 mL Multiple-dose
NALOXONE HCL
0.4 mg/mL
Protect from light.

HOSPIRA, INC., LAKE FOREST
LOT 39-337-4
“Krokodil” and “Tranq Dope”
Isonitazene
Medication-Assisted Treatment (MAT)

Medication-assisted treatment (MAT), including opioid treatment programs (OTPs), combines behavioral therapy and medications to treat substance use disorders.
Precipitated Withdrawal?

**Buprenorphine (Bup) Hospital Quick Start**

Either can order Bup in the hospital, even without an x-waiver.

- High-affinity, partial agonist opioid that is safe and highly effective for treating opioid use disorder.
- Is stable on methadone or prefers methadone, recommend continuation of methadone as treatment.

**Buprenorphine Dosing**

- Either Bup or Bup/Nx (buprenorphine/naloxone) films or tab sublingual (SL) are OK.
- If unable to take oral/SL, try Bup 0.3mg IV/IM.
- OK to start with lower initial dose: Bup 2-4mg SL.
- Total initial daily dose above 15mg may increase duration of action beyond 24 hrs.
- Bup SL onset 15 min, peak 1 hr. steady state 7 days
- May dose q8hr or if co-existing chronic pain split dose tid/qid.

**Complicating Factors**

- Bup will not decrease in patients with large surgeries
- Bup will not decrease in patients with recent methadone use

**Diagnosing Opioid Withdrawal**

Subjective symptoms AND one objective sign

Subjective: Patient reports feeling anxious, intolerable restlessness, weakness, insomnia, irritability, crying, tremor, nausea, diarrhea, miosis, dilated pupils, watery eyes, tachycardia, yawning, goose bumps, vomiting, diarrhea, tremor.

Typical withdrawal onset:

- ≥ 12 hrs after short-acting opioid
- ≥ 24 hrs after long-acting opioid
- ≥ 48 hrs after methadone (can be >72 hrs)

If unsure, use COWS (clinical opioid withdrawal scale). Start if COWS ≥ 9 AND one objective sign.

If Completing Withdrawal:

- Typically >72 hrs since last short-acting opioid, may be longer for methadone. Start Bup 4mg q4hr; renormalize usual dose 16-32mg/day. Subsequent days, OK to decrease frequency to qday.

**Opioid Analgesics**

- Pause opioid pain relievers when starting Bup.
- OK to introduce opioid pain relievers after Bup is started for breakthrough pain. Do not use methadone with Bup.

**Supportive Medications**

- Can be used as needed while waiting for withdrawal symptoms to resolve.

---

Discharge
- Document Opioid Withdrawal and/or Opioid Use Disorder as a diagnosis.
- If no X-waiver: Use loading dose up to 32mg for long effect and give rapid follow up.
- If X-waiver: Check CURES (not required in Emergency Department if ≤7 day prescription), prescribe sufficient Bup/Nx until follow-up.

Maintenance Treatment
16 mg Bup SL/day
- Titrate to suppress cravings; usual total dose 16-32mg/day

No Improvement in Withdrawal Symptoms:

- Withdrawal mimics: Influenza, DKA, sepsis, thyrotoxicosis, etc. Treat underlying illness.
- Inpatient: Initiated withdrawal symptoms without any other explanation. Continue Bup, treat symptoms with supportive medications.
- Precipitated withdrawal: Too large a dose started too soon after opioid agonist. Usually time limited, self resolving with supportive medications.
- In complex or severe cases of precipitated withdrawal, OK to stop Bup and give short acting full agonists.

Start Bup after withdrawal
Supportive meds prn, stop other opioids

Administer 8mg Bup SL

Administer 2nd dose
Inpatient: 8mg. Subsequent days, titrate from 15mg with additional 4-6mg prn cravings. ED: 8-24mg. Consider discharge with higher loading dose.

Withdrawal symptoms improved?

*Uncomplicated* opioid withdrawal?**

YES (stop other opioids)

NO

Maintenance Treatment
16 mg Bup SL/day
- Titrate to suppress cravings; usual total dose 16-32mg/day

Discharge
- Document Opioid Withdrawal and/or Opioid Use Disorder as a diagnosis.
- If no X-waiver: Use loading dose up to 32mg for long effect and give rapid follow up.
- If X-waiver: Check CURES (not required in Emergency Department if ≤7 day prescription), prescribe sufficient Bup/Nx until follow-up.
Referral for follow-up
mHealth

Mobile Health & Medical Technologies
RMPC supports Drug Take Back Programs
Mobile Devices
Naloxone in Schools
Benefits

• Health Outcomes
  • Individual
  • Population
• Costs
• Access
Thank you