Drugged Driving
June 29, 2010

Rebecca Sturdevant
MADD volunteer
Kalispell, MT 59901
Rebecca Sturdevant, MSN

- RN 29 yr, FNP prescriptive authority 14 yr
- Correctional health care 2½ yr
- Occupational health 14 yr
- Employer Substance Abuse Programs 14 yr
- FMCSA Education WIPT* March 07-Present
- Drugs & Human Performance Training
  - Indiana University Robert F. Borkenstein course
- MADD & Montana Common Sense Coalition
- Evan and Jim’s mother [MHP 330 & 337]

*Federal Motor Carrier Safety Administration Working Integrated Product Team
Disclosures

• Employee of Northwest Healthcare
  – Occupational Health Services at The Summit

• OHS provides forensic services for employers
  – Impairment Assessments
  – Fitness for Duty Medical Evaluations
  – Drug and Alcohol Testing

• Strong personal passion to keep impaired drivers off our highways
Louisiana 1999

22 dead, 16 severely injured, 5 minor injuries
DUI marijuana (THC 8ng/ml) & diphenhydramine (17 ng/ml)
A momentary lapse of concentration may result in serious injury or death.
Safety Requires:

• Sharp Senses
  – Clear Vision
  – Acute Hearing
  – Recognize hazard

• Rapid Reflex and Response
  – Motor skills
  – Coordination

• Good Judgement
IMPAIRED

Deviation from optimal performance

- Physical
  - reaction time
  - dexterity
  - balance
  - strength

- Mental
  - attention
  - memory
  - reasoning
  - communication

- Social
  - interpersonal
  - mood balance
Montana Rights

• Individual right to be impaired
  – Constitution, Section 10. Right of privacy. The right of individual privacy is essential to the well-being of a free society and shall not be infringed without the showing of a compelling state interest.

• Employer and Employee right to safe workplace
  – MCA 39-71-1502. Purpose. The purpose of this part is to reduce the incidence of occupational injury and illness by promoting safety in the workplace…

• Public right to safe highways
  – MCA 61-2-102. (2) "Highway traffic safety program" means a program designed to reduce traffic accidents, deaths, injuries to persons, and damage to property.
SAFETY

PRIVACY
Impairment from Drugs Studies

• Laboratory based [animal & human]
  – Physiologic [e.g., DSST, Critical tracking, Stop signal]
  – Cognitive [e.g., Wechsler, Tower of London]

• Simulated task [driving, machinery]
  – Cars on a test course [knock over the cones]
  – Computer based simulators

• Epidemiologic
  – Population crash/death/injury risk
  – Drug use
Drugs and Human Performance
Fact Sheets*

- National Highway Traffic Safety Administration
- Panel of international experts
  - Psychopharmacology, behavioral psychology, drug chemistry, forensic toxicology, medicine, and law enforcement officers trained in the recognition of drug effects on drivers
- Identified the specific effects that both illicit and prescription drugs have on driving
- Developed guidance for others when dealing with drug-impaired driving problems

CNS Depressants

- Alcohol (classic)
- Benzodiazepines
- GHB
- Hypnotics
- Barbiturates
- Anti-depressants
- Soma
- Antihistamines

- Drunk-like behavior
- Drowsiness
- Uncoordinated
- Slow reactions
- Vision blurry or double
- Decreased depth perception
- Nystagmus
Benadryl [diphenhydramine]

• In over-the-counter medications for allergies, sleep, cough, and motion sickness
• Impairment similar to alcohol (50 mg=0.1)
• Long lasting [8-12 hours]
• Sleepiness
• Decreased reaction time
• Impairment when not aware
Benzodiazepine Impairment

- Meta Analysis of chronic users
- Sensory Processing
- Psychomotor speed
- Nonverbal memory
- Visuospatial
- Effects persisted after withdrawal

Benzodiazepine & Driving

- Diazepam (Valium) & lorazepam (Ativan)
- Standard deviation of lateral position
- Effects with all doses were $\geq 0.05\%$ BAC
- Lorazepam 2 mg $> 0.2\%$ BAC after 8 days
  - On day one test aborted due to eyes closing
- SDLP correlates with RR crash

Ramaekers, Vermeeren, et al. 2010, Effects of Drugs on Human Performance
Robert F. Borkenstein course, Indiana University.
Soma & Injury Risk

• Norwegian data bases April 04-Sept 05
• Injuries caused by traffic accident
• Prescriptions filled within one week of injury
• Standardized incidence rates
  – Carisoprodol  3.7
  – Diazepam       2.8
  – Salbutamol     1.1

CNS Depressant Injury Risk

- Norwegian data bases April 04-Sept 05
- Injuries caused by traffic accident
- Prescriptions filled within one week of injury
- Standardized incidence rates
  - Any prescribed drug 1.4
  - Natural opium alkaloids 2.0
  - Benzodiazepine tranquilizers 2.9
  - Benzodiazepine hypnotics 3.3

Narcotic Analgesics
Opioids

- Heroin
- Codeine
- Morphine
- Lortab
- Oxycontin
- Percocet
- Demerol
- Fentanyl

- Poor night vision
- Drowsiness
- Delayed reaction time
- Respiratory depression
- Constricted pupils
Opioid Impairment

- Oral sustained release morphine [62 mg]
- Non cancer pain greater than 6 months
- Morphine treated group improved
  - Stroop interference
  - DSST
- Improvement correlated with depression and pain improvement

Opioid Impairment

• Oxycodone 30 mg
  – DSST effect seen for 4 hours
  – Logical reasoning effect 5+ hours
  – Hand-eye coordination

• Morphine 40 mg
  – Not significant

• Ativan 2 mg
  – Effects greater than oxycodone

Zacny & Gutierrez, Characterizing the subjective, psychomotor, and physiologic effects of oral oxycodone in non-drug-abusing volunteers, Psychopharmacology (2003) 170:242-254
CNS Stimulants

- Amphetamine
- Methamphetamine
- Ritalin
- Adderall
- Cylert
- Cocaine

- Improve alertness
- Anxiety, Irritable
- Risky choices
- Inattention, impatience
- Withdrawal drowsiness
- Dilated pupils
D&A: Yes or No? Cocaine, amphetamine, and other stimulant drugs:

- Improve alertness & reaction time
  Yes, at least in low doses, but extreme fatigue in withdrawal

- Impair inhibition, alter judgment
  Yes [Beveridge, et.al., 2008]

- Improve vision at night
  May see better in the dark as pupil size increases, but pupils do not constrict with oncoming headlights which may impair driving vision

- Decrease risk of fatal crash in truck drivers
  No, increased risk [RR 8.8] [Drummer, 2003]
Hallucinogens

- Ecstasy (MDMA)
- LSD
- Mushrooms
  - Peyote, psilocybin
- Salvia
- Nutmeg
- Morning-glory seeds
- Datura

- Hallucinations
- Visual, audio, sensations
- Distorted space & time perception
- Awful judgment
Disassociative Anesthetics

- **PCP**
  - Angel Dust, Supergrass
  - Boat, Tic Tac, Zoom
  - Shermans

- **Ketamine**
  - Khat, Qat, Kat,
  - Chat, Miraa
  - Quaadka

- **Dextromethorphan**
  - CCC, Triple C, Candy
  - Robo, Velvet, Rojo

- **DANGER** due to violence and strength
- Vision blurry and double
- May have hallucinations
- Poor muscle control
- ↓ sensitivity to pain
Inhalants

- **Volatile Solvents**
  - Turpentine, acetone
  - Gasoline, jet fuel

- **Anesthetic Gases**
  - Ether, nitrous oxide

- **Aerosols**
  - Hairspray
  - Insecticides
  - Cooking products

- **Volatile nitrites**

  - Drunk-like behavior
  - Vision problems
  - Dizziness
  - Impaired judgment
  - Vomiting
Cannabis

- Marijuana
- BC Bud
- Hashish, Hash
- Dronabinol
- Sativex

- Long lasting effects due to long half-life
- Delayed reaction time
- Tracking impaired
- Lack of convergence
- Poor judgment
- Carefree attitude
- Lack of motivation
50-46-205. Limitations of Medical Marijuana Act

This chapter does not permit:

(a) any person to operate, navigate, or be in actual physical control of any motor vehicle, aircraft, or motorboat while under the influence of marijuana; or

(b) the smoking of marijuana:
   (i) in a school bus or other form of public transportation;
   (ii) on any school grounds;
   (iii) in any correctional facility; or
   (iv) at any public park, public beach, public recreation center, or youth center.

(2) Nothing in this chapter may be construed to require:

(a) a government medical assistance program or private health insurer to reimburse a person for costs associated with the medical use of marijuana; or

(b) an employer to accommodate the medical use of marijuana in any workplace.

Montana Code Annotated

State vs Nelson 07-0339

- Arrested for growing marijuana and operating a methamphetamine laboratory May 16, 2006
- MM registration card Dec 8, 2006
- COP to one count for lab – 3 year deferred
- Court limited him to Marinol – no marijuana citing concerns about children in the home
- He said Marinol was too expensive
State vs Nelson

- ACLU and Patients & Families United supported Nelson with amicus briefs
- California case law was used to support Nelson
- “When a qualifying patient uses medical marijuana in accordance with the MMA, he is receiving lawful medical treatment. In this context, medical marijuana is most properly viewed as a prescription drug.”
State vs Nelson

• “...just as a sentencing court may impose a condition that prohibits a defendant from abusing lawfully-obtained prescription drugs, so may a court prohibit a defendant from abusing medical marijuana.”
Q&A: How long does 20 mg dose of smoked cannabis cause impairment in cannabis-naïve pilots in a flight simulator?

• No impairment noted
• Impairment lasts only as long as perceived euphoric effect
• Up to 2 hours after smoking
• Up to 4 hours after smoking
• Up to 8 hours after smoking
• Up to 24 hours after smoking
Pot Smoking Pilots

• 11 pilots (2 dropped for MJ use outside of study)
• Simulator flights 0, 0.25, 4, 8, 24, 48 hr post MJ
  – 20 mg dose THC vs placebo joint without THC
• Significant effects at 24 hours, recovered at 48 hr
• “At 8 and 24 hours pilots reported no subjective experience of the drug’s effect, even though objective measures of performance showed decrements.”

IF IT DOESN’T MAKE SENSE HERE, WHY DOES IT MAKE SENSE WHEN YOU DRIVE?

www.potanddriving.cpha.ca
Effects of THC in serum

• Significant effects found in THC levels:
  – 2-5 ng/ml -- Only Critical Tracking impaired
  – >5 ng/ml -- Stop signal & Tower of London impaired

• Critical tracking effects compared to alcohol
  – First 2 hours equivalent to BAC > 1.0 mg/ml
  – 2-6 hours equivalent to BAC > 0.05 mg/ml

• Stop signal and Tower of London tests do not show impairment with BAC <0.06 mg/ml

Relative Risk of Death

- Drivers killed in road crashes (3398)
- Blood specimens within 4 hours of crash
- Responsibility analysis based on 8 mitigating factors; only “culpable” drivers were included
- 29.1% had alcohol $\geq 0.05\%$ BAC
- 26.7% had psychoactive drugs
  - Cannabinoids 13.5%, Opioids 4.9%,
  - Stimulants 4.1%, Benzodiazepines, 4.1%

## Relative Risk of Death

<table>
<thead>
<tr>
<th>Drug &amp; Alcohol Free</th>
<th>Drivers</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug &amp; Alcohol Free</td>
<td>1704 (50%)</td>
<td>1</td>
</tr>
<tr>
<td>Opiates</td>
<td>59 (1.7%)</td>
<td>1.41*</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>34 (1%)</td>
<td>1.27*</td>
</tr>
<tr>
<td>THC only</td>
<td>58 (1.7%)</td>
<td>2.7</td>
</tr>
<tr>
<td>THC only (≥ 5ng/ml)</td>
<td>49(1.4%)</td>
<td>6.6</td>
</tr>
<tr>
<td>Stimulants (all drivers)</td>
<td>53 (1.6%)</td>
<td>2.27*</td>
</tr>
<tr>
<td>Stimulants (truckers)</td>
<td>22(15.8%)</td>
<td>8.83</td>
</tr>
</tbody>
</table>

*Not significant

THC ≥ 5ng/ml odds ratio similar to drivers with BAC ≥ 0.15%
THC + BAC ≥ 0.05% odds ratio 2.8 times BAC ≥ 0.05% alone
Benzodiazepines not usually found alone, which reduced power

Responsibility for Death

• 10,799 drivers involved in traffic fatalities in France 2001-2003; prospective study
• Blood specimen within 4 hours of crash
• THC cut off level 1 ng/ml
• Responsibility analysis

Biecheler, et.al., 2008, SAM Survey on “Drugs and Fatal Accidents”: Search of substances consumed and comparison between drivers involved under the influence of alcohol or cannabis. Traf Inj Prev 9:11-21
Responsibility for Death

<table>
<thead>
<tr>
<th></th>
<th>Alcohol &amp; drug free</th>
<th>THC ≥ 1 ng/ml</th>
<th>Alcohol ≥ 0.05%</th>
<th>Alcohol and THC</th>
</tr>
</thead>
<tbody>
<tr>
<td>All drivers</td>
<td>7886</td>
<td>391</td>
<td>1908</td>
<td>278</td>
</tr>
<tr>
<td>Known responsibility</td>
<td>7339</td>
<td>360</td>
<td>1823</td>
<td>272</td>
</tr>
<tr>
<td>Responsible</td>
<td>3996</td>
<td>252</td>
<td>1647</td>
<td>254</td>
</tr>
<tr>
<td>Not responsible</td>
<td>3343</td>
<td>108</td>
<td>176</td>
<td>18</td>
</tr>
<tr>
<td>Resp/not resp</td>
<td>1.2</td>
<td>2.3</td>
<td>9.4</td>
<td>14.1</td>
</tr>
</tbody>
</table>

Biecheler, et.al., 2008, SAM Survey on “Drugs and Fatal Accidents”: Search of substances consumed and comparison between drivers involved under the influence of alcohol or cannabis. *Traf Inj Prev* 9:11-21
Car which crushed his car
driver had BAC 0.16
and THC 7 ng/ml
Marijuana

• NOT legal
• NOT medicine
• NOT good for you
• NOT in the workplace
• NOT in school
• NOT on the highway
Montana Forensic DUI Specimens

• In 2009 32% of DUI cases were poly drug
  – had more than one category of drugs
• In 2009 fatal crashes
  – 32% drugs
  – 36% alcohol
  – 14% mixture

Courtesy of Sara J. Hansen, Forensic Toxicologist
Montana Department of Justice, Forensic Science Division
## Montana Forensic DUI Specimens

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL cannabis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannabis + alcohol</td>
<td>65</td>
<td>85</td>
<td>113</td>
</tr>
<tr>
<td>Cannabis + fatal</td>
<td>30</td>
<td>33</td>
<td>39</td>
</tr>
<tr>
<td>Cannabis + alcohol + fatal</td>
<td>11</td>
<td>18</td>
<td>21</td>
</tr>
</tbody>
</table>

Courtesy of Sara J. Hansen, Forensic Toxicologist
Montana Department of Justice, Forensic Science Division
• 399 DUI arrests from 2009 reviewed
  – Sample was primarily litigated cases
  – Convenience sample of cases found in district and justice courts in Flathead County
  – Arrests made primarily by FCSO and MHP
    • Felony cases from police departments
• Limited data available—public access
  – DMV data not included in this study
  – Outcome data did not include use of Interlocks
**Demographics**

<table>
<thead>
<tr>
<th></th>
<th>All cases</th>
<th>Drugged Only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Age</strong></td>
<td>39</td>
<td>38</td>
</tr>
<tr>
<td><strong>Under 21</strong></td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Male %</strong></td>
<td>73%</td>
<td>62%</td>
</tr>
<tr>
<td><strong>Female %</strong></td>
<td>27%</td>
<td>38%</td>
</tr>
<tr>
<td><strong>On felony probation</strong></td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Refusals</strong></td>
<td>48%</td>
<td>46%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>399</td>
<td>91</td>
</tr>
</tbody>
</table>
Court Monitoring

Flathead County: Sturdevant

• Possible drugged drivers n=91
• Based on tested specimens, admissions, drugs found with the driver, and other relevant information from the arrest report
• Most unknown due to refusal to test or also had significant alcohol
• No DRE cases in 2009 except 1 refusal
<table>
<thead>
<tr>
<th>Drug</th>
<th># cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana</td>
<td>23</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>5</td>
</tr>
<tr>
<td>Narcotics</td>
<td>20</td>
</tr>
<tr>
<td>CNS Depressants</td>
<td>18</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>35</td>
</tr>
<tr>
<td>Alcohol plus drugs</td>
<td>34</td>
</tr>
<tr>
<td>Alcohol &lt; 0.08%</td>
<td>16</td>
</tr>
</tbody>
</table>
Court Monitoring
Flathead County: Sturdevant

Marijuana impaired drivers with negative BAC and lab confirmed THC in blood

<table>
<thead>
<tr>
<th>THC level</th>
<th>Other drugs</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ng/ml</td>
<td>Sleeping pills</td>
<td>Careless (Haynes case)</td>
</tr>
<tr>
<td>7 ng/ml</td>
<td>Clonazepam</td>
<td>DUI-1</td>
</tr>
<tr>
<td>9 ng.m</td>
<td>Clonazapam, Soma</td>
<td>Negligent endangerment</td>
</tr>
<tr>
<td>3 ng/ml</td>
<td>Clonazepam, methadone, benadryl</td>
<td>Negligent homicide</td>
</tr>
<tr>
<td>3 ng/ml</td>
<td>Methamphetamine</td>
<td>Dismissed (towed vehicle)</td>
</tr>
<tr>
<td>4 ng/ml</td>
<td>Methamphetamine, Soma, lorazepam</td>
<td>FTA(6 yr old child in car)</td>
</tr>
</tbody>
</table>
Court Monitoring
Flathead County:  Sturdevant

• Outcome based on whether defendant was:
  – Guilty of arrest charge
  – Guilty of amended charge but still DUI
  – Guilty of amended charge but NOT DUI
  – Charges dismissed

• Data collection ongoing (304 complete)
  – Cases still open
  – Records unavailable
Court Monitoring
Flathead County: Sturdevant

REFUSAL to Provide Specimen

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUI 1</td>
<td>40%</td>
</tr>
<tr>
<td>DUI 2</td>
<td>50%</td>
</tr>
<tr>
<td>DUI 3</td>
<td>60%</td>
</tr>
<tr>
<td>DUI Felony</td>
<td>50%</td>
</tr>
<tr>
<td>OVERALL</td>
<td>45%</td>
</tr>
</tbody>
</table>
Court Monitoring
Flathead County: Sturdevant

REFUSAL to Provide Specimen
Green = all, Blue = drugged only
Court Monitoring
Flathead County: Sturdevant

Specimen Obtained & Outcomes

- Same charge
- Alcohol related
- Non Alcohol
- Dismissed

Refused
Specimen
Court Monitoring
Flathead County: Sturdevant

Field Sobriety Testing (FST) & Outcomes

Horizontal Gaze Nystagmus

- Refused
- HGN Done
- HGN 6

Same charge  Alcohol related  Non Alcohol  Dismissed
Court Monitoring
Flathead County: Sturdevant

Field Sobriety Testing (FST) & Outcomes

- Same charge
- Alcohol related
- Non Alcohol
- Dismissed

Walk & Turn

- Refused
- W&T Done
- W&T 8
Court Monitoring
Flathead County: Sturdevant

Field Sobriety Testing (FST) & Outcomes

One-leg Stand
- Refused
- OLS Done
- OLS 4

<table>
<thead>
<tr>
<th>Category</th>
<th>Same charge</th>
<th>Alcohol related</th>
<th>Non Alcohol</th>
<th>Dismissed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same charge</td>
<td>35%</td>
<td>35%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Alcohol related</td>
<td>25%</td>
<td>40%</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td>Non Alcohol</td>
<td>20%</td>
<td>20%</td>
<td>30%</td>
<td>5%</td>
</tr>
<tr>
<td>Dismissed</td>
<td>15%</td>
<td>15%</td>
<td>10%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Court Monitoring
Flathead County: Sturdevant

• It helps to be Canadian
  – Concern that DUI conviction would be a problem for driving record in Canada

• It helps to have a CDL
  – Concern that driver would lose job

• It helps to pay a private lawyer
  – Charge ↓ to non-alcohol offense 40% vs 14%
  – No difference in fines or dismissals
Court Monitoring
Flathead County: Sturdevant

Arrest Date to Sentence Date
How many days does it take?

Public Defender: 210 days
Pro Se: 79 days
Retained Counsel: 227 days
Campaign to Eliminate Drunk Driving

• Increased DUI enforcement
  – Sobriety checkpoints & saturation patrols
• Mandatory ignition interlocks
  – for all convicted DUI offenders
• Develop advanced vehicle based technology
  – Breath, transdermal, ocular measurements
• Public support for these efforts
  – Change the culture; change the laws

Mothers Against Drunk Driving www.madd.org
Making a Difference Daily
Highway Patrol Act of 1935

• First Offense DUI
  – no less than $25 fine, no more than $300
  – imprisonment for no less than 10 days,
    no more than 6 months

• Second Offense DUI
  – no less than $300 fine, no more than $1000
  – imprisonment for no less than 6 months,
    no more than 3 years

• Third Offense DUI
  – no less than $1000 fine, no more than $5000
  – imprisonment for no less than 3 years,
    no more than 10 years

$1 in 1935 = $16.12 in 2010
Violent Crime

• A motor vehicle is a several thousand pound weapon aimed at everyone else on the road
  – Driving is a privilege with responsibility to public
• Drinking/using drugs and driving is a choice
• Harming another person, whether intentional or not, is a violent crime
• Accountability is critical; treatment is vital
• Crashes caused by impaired driving are preventable—we can save lives!
Acknowledgments

• MADD
• NWHC Medical Library
• Montana Department of Justice
  – Montana Highway Patrol
  – Motor Vehicle Division
  – Crime Lab
• Montana Department of Transportation
• Flathead County Attorney Ed Corrigan and his staff
• Flathead County District Court and Justice Court
• Flathead County Sheriff Department
• Kalispell City Police Department
• Kalispell Municipal Court
Truck which crushed his car
driver had BAC 0.16
On his way to a pharming party
Stop Impaired Driving