

# 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. Borkestein 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

# IMPAIRMENT

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

\*<http://www.nhtsa.dot.gov/people/injury/research/job185drugs/index.htm>

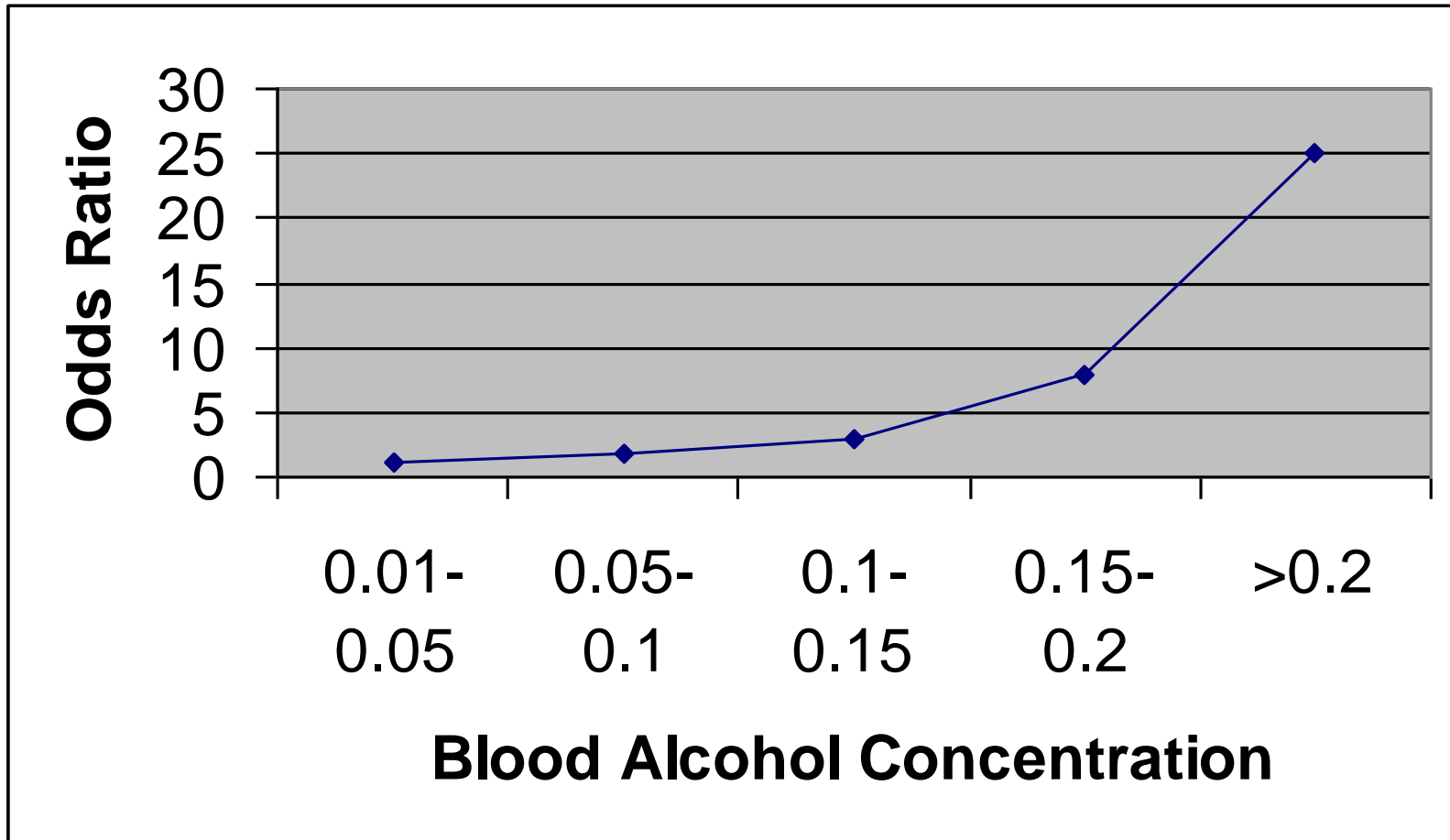
# CNS Depressants



- 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



# Relative Risk of Death



Drummer, et.al., The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes. *Accident Analysis and Prevention* 943(2003) 1-10.



# 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

Bramness, et.al., 2007, The risk of traffic accidents after prescriptions of carisoprodol. Accid Anal Prev 39:1050-1055..

# 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

Engleland, et.al., 2007, Risk of road traffic accidents associated with the prescription of drugs: A registry-based cohort study. *Ann Epidemiol* 17:597-602



# 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

Tassain et al. Long term effects of oral sustained release morphine on neuropsychological performance in patients with chronic non-cancer pain. *Pain* 104 (2003) 389-400

# 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

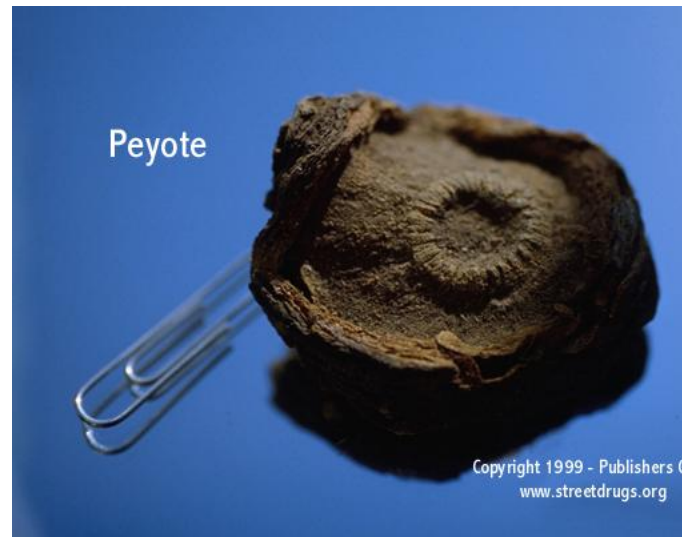
- Decrease risk of fatal crash in truck drivers

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
- Dextromethophan
  - 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

<http://data.opi.mt.gov/bills/mca/50/46/50-46-205.htm>

# 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.”

Leirer, 1991 Marijuana Carry-Over Effects on Aircraft Pilot Performance, Aviation, Space, and Environmental Medicine, March, 1991, 221-227.



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

[www.potanddriving.cpha.ca](http://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

Ramaekers, et.al., 2006, Cognition and Motor Control as a Function of  $\Delta_9$ -THC concentration in serum and oral fluid: Limits of Impairment. Drug and Alcohol Dependence 85: 114-122.

# 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%

Drummer, et.al., 2003, The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes. *Accident Analysis and Prevention* 943 1-10.

# Relative Risk of Death

	Drivers	Odds Ratio
Drug & Alcohol Free	1704 (50%)	1
Opiates	59 (1.7%)	1.41*
Benzodiazepines	34 (1%)	1.27*
THC only	58 (1.7%)	2.7
THC only ( $\geq 5\text{ng/ml}$ )	49(1.4%)	6.6
Stimulants (all drivers)	53 (1.6%)	2.27*
Stimulants (truckers)	22(15.8%)	8.83
*Not significant		

THC  $\geq 5\text{ng/ml}$  odds ratio similar to drivers with BAC  $\geq 0.15\%$   
 THC + BAC  $\geq 0.05\%$  odds ratio 2.8 times BAC  $\geq 0.05\%$  alone  
 Benzodiazepines not usually found alone, which reduced power

Drummer, et.al., 2003, The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes. Accident Analysis and Prevention 943:1-10.

# 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

	Alcohol & drug free	THC $\geq$ 1 ng/ml	Alcohol $\geq$ 0.05%	Alcohol and THC
All drivers	7886	391	1908	278
Known responsibility	7339	360	1823	272
Responsible	3996	252	1647	254
Not responsible	3343	108	176	18
Resp/not resp	1.2	2.3	9.4	14.1

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

	2007	2008	2009
TOTAL cannabis		169	231
Cannabis + alcohol	65	85	113
Cannabis + fatal	30	33	39
Cannabis + alcohol + fatal	11	18	21

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



# Court Monitoring

## Flathead County: Sturdevant

- 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



# Court Monitoring

## Flathead County: Sturdevant

<b>Demographics</b>	<b>All cases</b>	<b>Drugged Only</b>
Average Age	39	38
Under 21	10%	9%
Male %	73%	62%
Female %	27%	38%
On felony probation	5%	7%
Refusals	48%	46%
<b>TOTAL</b>	<b>399</b>	<b>91</b>



# 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



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# Court Monitoring

## Flathead County: Sturdevant

Drug	# cases
Marijuana	23
Methamphetamine	5
Narcotics	20
CNS Depressants	18
Other/unknown	35
Alcohol plus drugs	34
Alcohol < 0.08%	16



# Court Monitoring

## Flathead County: Sturdevant

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

THC level	Other drugs	Outcome
3 ng/ml	Sleeping pills	Careless (Haynes case)
7 ng/ml	Clonazepam	DUI-1
9 ng.m	Clonazepam, Soma	Negligent endangerment
3 ng/ml	Clonazepam, methadone, benadryl	Negligent homicide
3 ng/ml	Methamphetamine	Dismissed (towed vehicle)
4 ng/ml	Methamphetamine, Soma, lorazepam	FTA(6 yr old child in car)





# 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

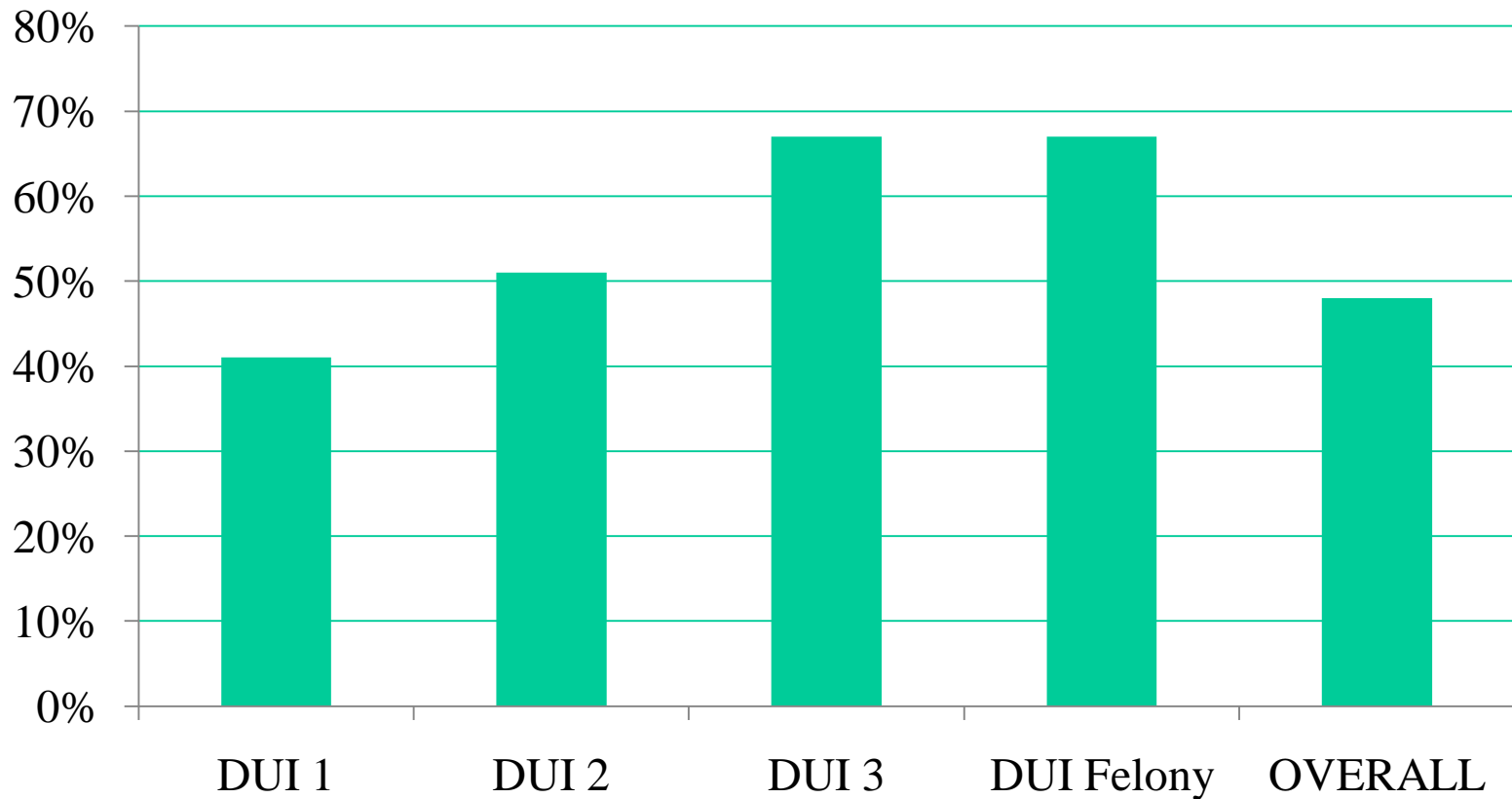


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# Court Monitoring

## Flathead County: Sturdevant

### REFUSAL to Provide Specimen





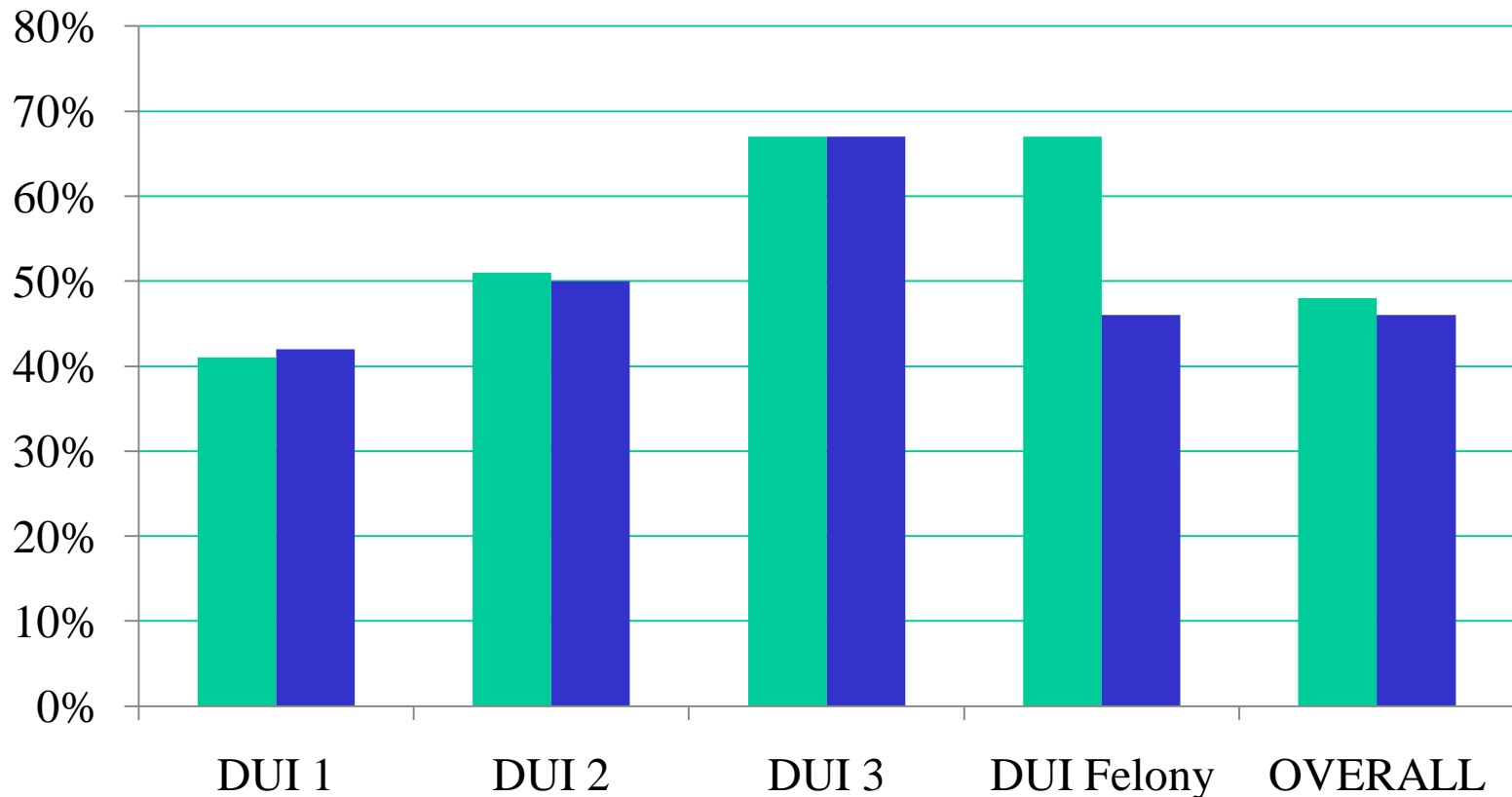
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# Court Monitoring

## Flathead County: Sturdevant

### REFUSAL to Provide Specimen

Green = all, Blue = drugged only



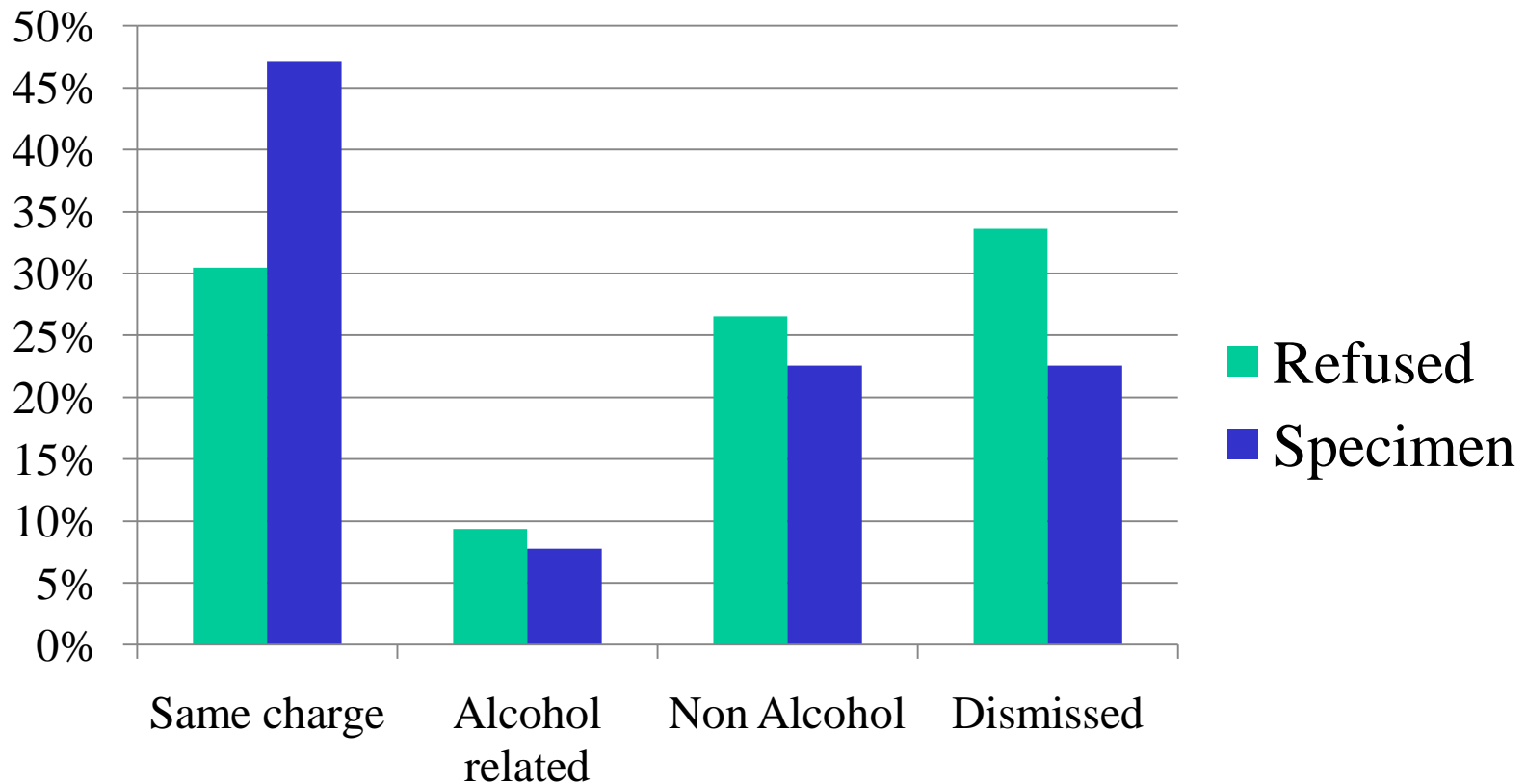


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# Court Monitoring

## Flathead County: Sturdevant

### Specimen Obtained & Outcomes



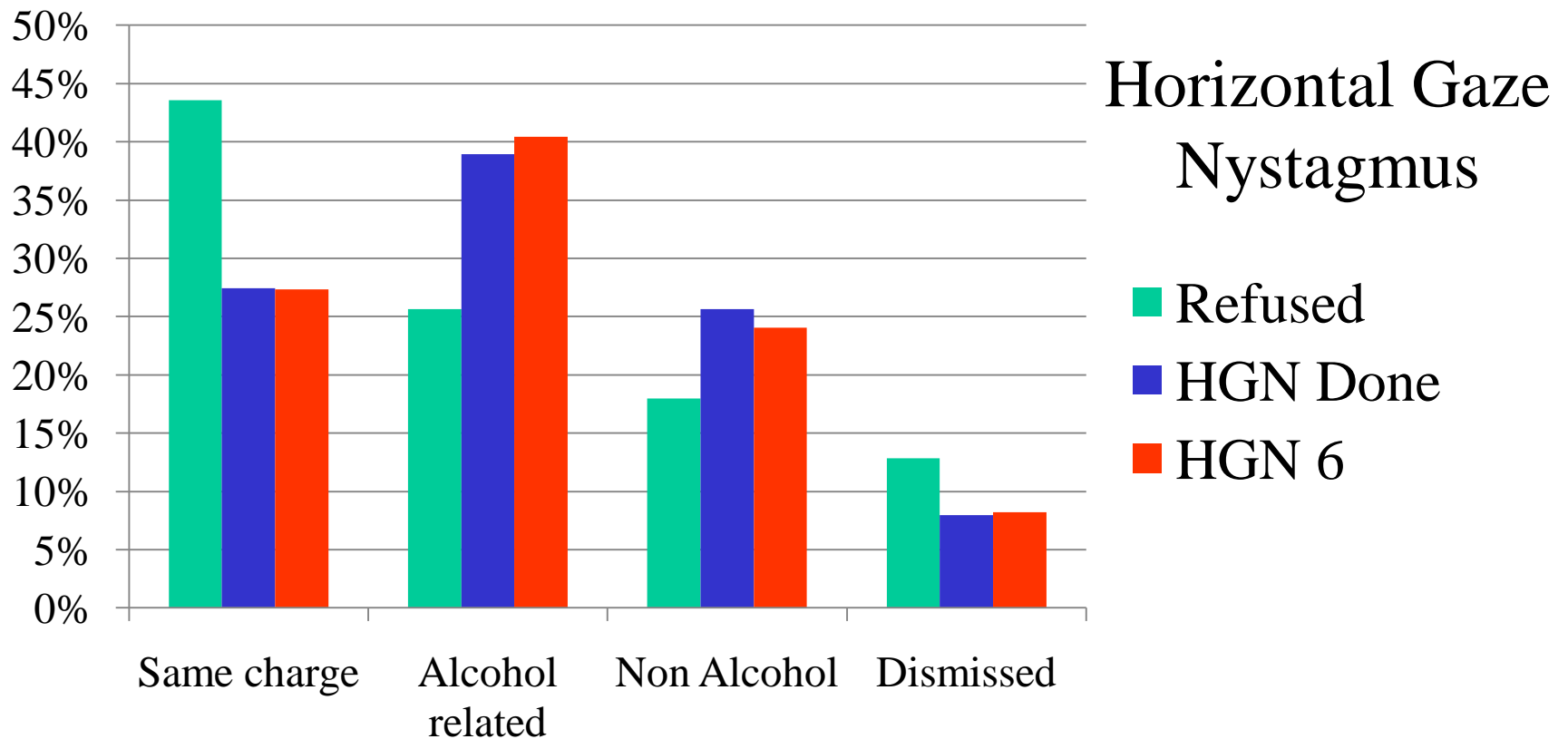


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# Court Monitoring

## Flathead County: Sturdevant

### Field Sobriety Testing (FST) & Outcomes



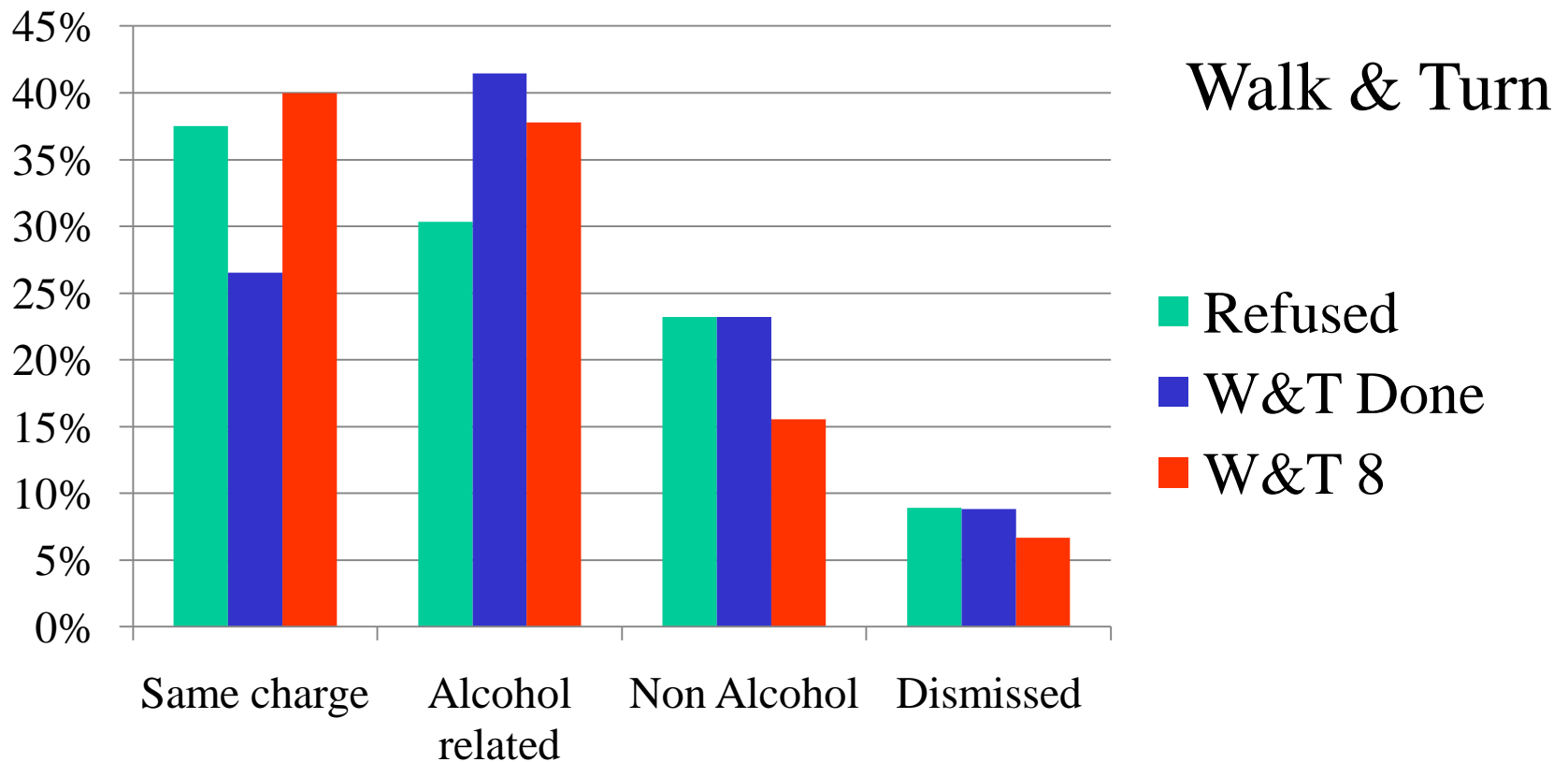


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# Court Monitoring

## Flathead County: Sturdevant

### Field Sobriety Testing (FST) & Outcomes



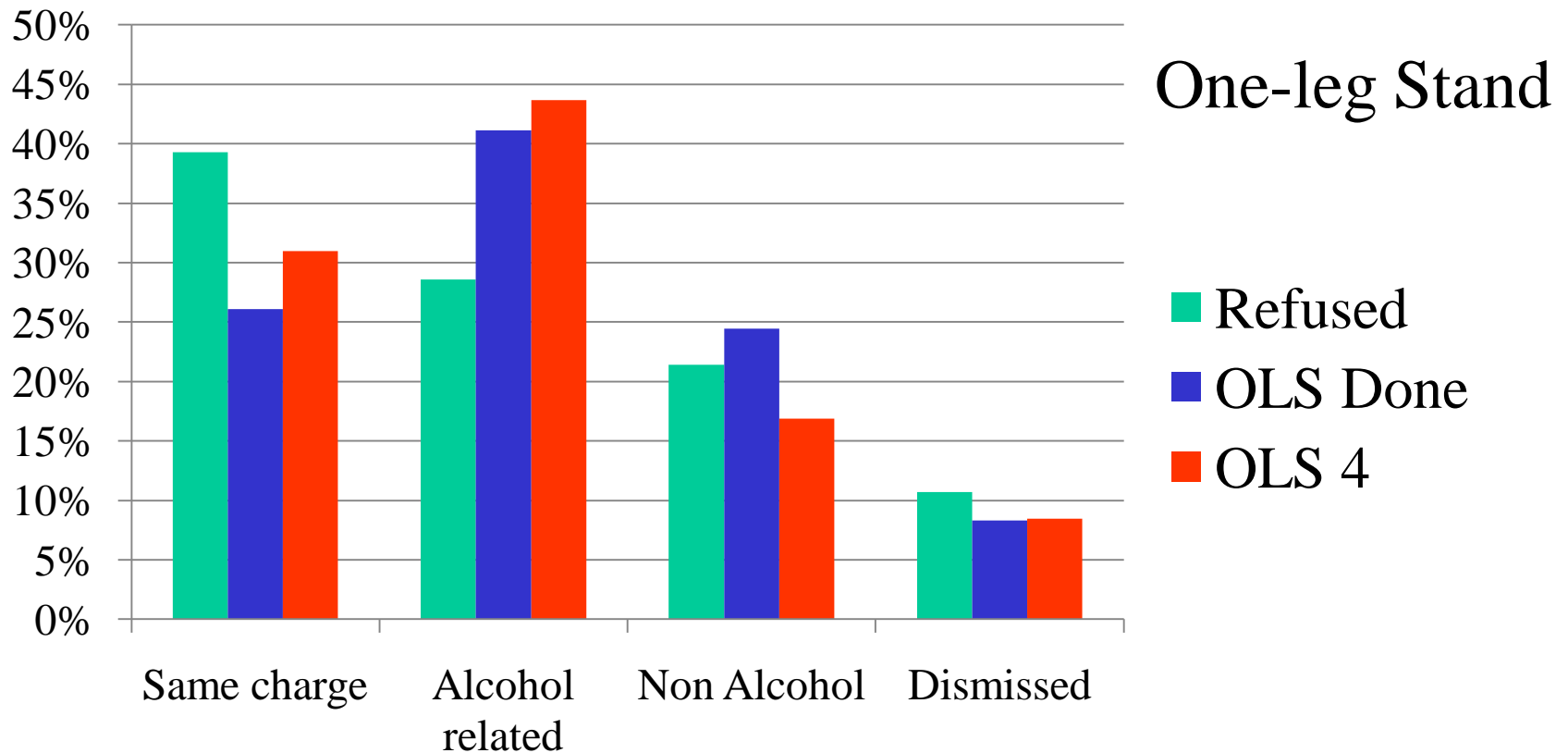


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# Court Monitoring

## Flathead County: Sturdevant

### Field Sobriety Testing (FST) & Outcomes





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# 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





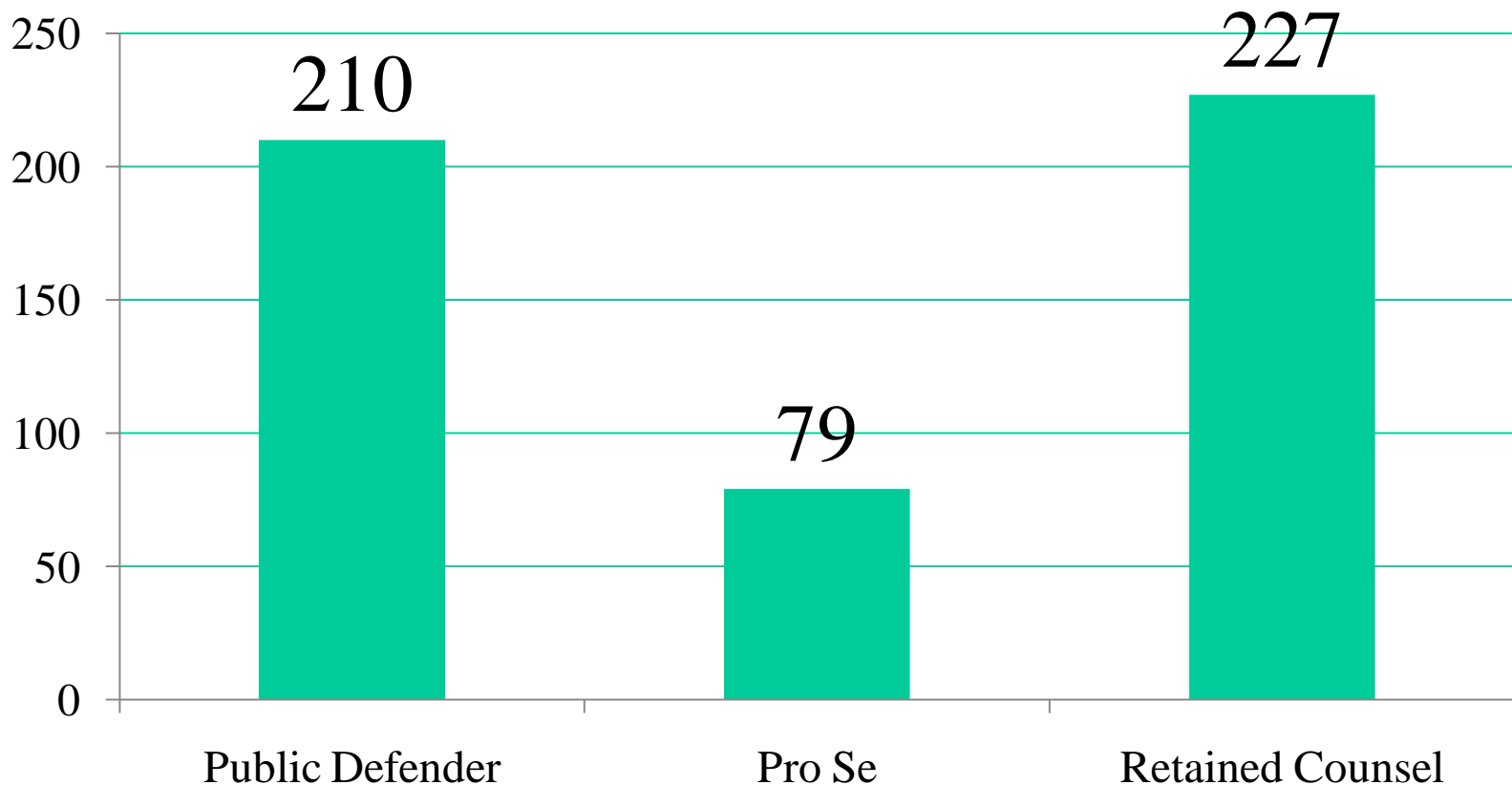
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# Court Monitoring

## Flathead County: Sturdevant

### Arrest Date to Sentence Date

How many days does it take?





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# 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](http://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

