METHADONE AND DRIVING

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Are people taking methadone and driving?
Methadone prevalence in DUlID cases
New Hampshire – Dept of Safety

- 2007 Statistics
  - 52 cases were positive for Methadone
    - Approximately 3%
  - 39 out of 52 highway related; 4 MVA
  - 13 out of 52 – OCME; 3 fatal MVA
Methadone prevalence in DUID cases
NYSP

Methadone identified in 3.6% of all DUID cases in the last 3 years
A 35% increase in the number of methadone identification in DUID cases - 8.7%+
A 130% increase in the number of methadone identifications in PM cases – 9.7%+
Methadone prevalence in DUID cases

Wisconsin State Laboratory of Hygiene

Methadone is the 7th most frequently identified drug

Increased from 2 – 5 % of drug positive cases
Methadone prevalence in DUID Cases
Southwestern Institute of Forensic Sciences
2006 - Methadone was detected in 7.4% of our 9789 cases. 262 impaired drivers (5.4%) and 463 death investigation (10%) cases. The 5th most frequently found drug other than ethanol in DUID cases.
2004 – 2005 SOFT/AAFS Survey of DRE Labs
Most Frequently Encountered Drugs
(no data from 3 labs; N = 39)
2004-2005 SOFT/AAFS Survey of DRE Labs
Most Frequently Encountered Drugs
(no data from 3 labs; N = 39)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine/Codeine</td>
<td>28</td>
</tr>
<tr>
<td>Carisoprodol/meprobamate</td>
<td>26</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>16</td>
</tr>
<tr>
<td>Methadone</td>
<td>12</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>10</td>
</tr>
<tr>
<td>Zolpidem</td>
<td>6</td>
</tr>
<tr>
<td>MDMA</td>
<td>5</td>
</tr>
<tr>
<td>PCP</td>
<td>8</td>
</tr>
<tr>
<td>Propoxyphene</td>
<td>5</td>
</tr>
<tr>
<td>Butalbital</td>
<td>4</td>
</tr>
</tbody>
</table>
History

- Synthesized in 1937, during World War II, by German scientists
- A synthetic Opioid
- Chemically unlike morphine or heroin

Morphine  Heroin  Methadone
History

- Introduced into the United States in 1947 as an analgesic by Eli Lilly and Company
- 1964 began use in Methadone Maintenance Treatment
- Since 2000 it has been increasingly prescribed for pain management

- Schedule II – Controlled Substance Act
Methadone Maintenance Therapy

- 1999 – 20% of the estimated 810,000 heroin addicts receive MMT = 162,000

- MMT:
  - Individualized health care
  - Medically prescribed opioid
  - Administered orally on a daily basis
  - Strict program conditions and guidelines

- The patient remains physically dependent on a opioid but is freed from the uncontrolled, compulsive and disruptive behavior

- Improved subject health
- Decreased criminal activity
- Increased employment
U.S. Formulations

- Oral Solutions
  - 10 mg of methadone hydrochloride per mL.
  - Methadose™ Oral Concentrate
    - Cherry flavored liquid concentrate.
  - Methadose™ Sugar-Free Oral Concentrate (methadone hydrochloride USP) is a dye-free, sugar-free, unflavored liquid concentrate of methadone hydrochloride.
U.S. Formulations

- **Tablets**
  - 5 mg, 10 mg
  - Dolophine® Hydrochloride

- **Diskets (dispersible tablet)**
  - 40 mg methadose wafers
  - formulated with insoluble excipients to deter the use of this drug by injection

- **Other:**
  - 10mg/mL intensol
    - Intended to be diluted with at least 1 ounce of liquid
  - 10 mg/mL, 50 mg/1mL and 50 mg/2mL ampoules
  - Linctus - 2mg/5mL used in the UK for treating coughing in terminal disease
Current Methadone Use

2006 Distribution of Methadone

- 5 mg & 10 mg Tablets (4,412,615 grams)
- Liquids (5,283,295 grams)
- 40 mg Diskettes (3,236,405 grams)
- All Others (665,224 grams)

Source: DEA ARCOS 04/2007
DEA Office of Diversion Control Methadone Mortality Working Group
Current Methadone Use

Number of Prescriptions Dispensed for Methadone

Source: IMS Health Prescription Audit

DEA Office of Diversion Control Methadone Mortality Working Group

04/2007
Effects

- Low to moderate doses
  - Analgesia - Pain relief
  - Decreased Drug Craving
  - Respiration depressed
  - Pupils constricted (miosis)
  - Constipation
  - Subjective effects:
    - Drowsiness
    - Light Headed
    - Dizziness
    - Headache
  - Suppressed cough reflex
  - Decreased appetite
  - Sweating
  - Reduced sex drive
  - A variety of hormonal changes
Effects

- Slightly higher doses
  - Euphoria
    - May experience restlessness and anxiety (dysphoria)
  - Agitation
  - Confusion
  - Disorientation
  - Nausea and vomiting more common

- Highest doses
  - Unconsciousness
  - Decreased body temperature and blood pressure
  - Constricted pupils often used as an indicator of OD
  - Respiration rate now dangerously low and is the cause of death in OD
  - Cardiac Conduction Effects
Effects

- Additive effects with other opioids
- Additive effects with Alcohol
- Additive effects with CNS Depressants
Current Methadone Use

DAWN Emergency Department Visits, 2005

Source: Drug Abuse Warning Network (NIDA)

Methadone ranked 3rd among all opioid analgesics, 4th among all controlled pharmaceuticals, and 8th among all controlled substances.
Current Methadone Use

Poison Control Data, 2005:
Number of Deaths Per 100 Exposures

Source: American Association of Poison Control Centers (AAPCC)
Three Primary Scenarios:

1) Accumulation to toxic levels of methadone during the start of opioid treatment or pain management due to overestimation of tolerance and methadone’s long, often variable, half-life.

2) Misuse of diverted methadone by individuals with little or no opioid tolerance.

3) Synergistic effects of methadone in combination with other CNS depressants (i.e., alcohol, benzodiazepines or other opioids).
Miosis

- **Laboratory Studies**
  - Weinhold and Bigelow, 1993
    - Methadone (50-60 mg p.o.).
    - Peak miosis was best detected under moderately dim interior lighting 90 min after methadone
  - Higgins et al., Clin Pharmacol Ther. 1985
    - 20 mg methadone to 28 males beginning MMT
    - Miosis observed in all subjects
    - Proportional to reported heroin use and years since first opiate use
Opioid Receptors

- 1973  Discovery of opioid receptors
- Opiate drugs work by mimicking natural opiate-like molecules made and used in the brain.
  - 1975 - Identified the first endogenous brain opioids, called endorphins.
- Three major receptor subtypes
  - Mu (m)
    - mu1 analgesia
    - mu2 respiratory depression
  - Kappa (k)
  - Delta (d)
- Principally found in the central nervous system and the gastrointestinal tract
Euphoria – Reinforcing Effect

- **Limbic system**
  - Main regulator of emotion
  - Surrounds the brain stem below the cerebral cortex
  - Opiate receptors very dense

- **Euphoria**
  - Opioids are not rapidly removed as endorphins are
  - Activate receptors for extended periods
  - Increases dopamine level in nucleus accumbens

- Reinforcing effects seem to also be due to other factors not completely understood
Pain

▪ Incidence
  ▫ 2006 National Center for Health Statistics Report
    ▪ 26% of Americans (76.5 million) over 20 years of age had pain of any sort that persisted for more than 24 hours
    ▪ Pain affects more Americans than diabetes, heart disease and cancer combined.

▪ Duration
  ▫ 1999-2002 Study of people over 20 years of age
    ▪ 12% pain for 1-3 months
    ▪ 14% pain for 3-12 months
    ▪ 42% pain for more than one year
Opioids vs Pain

- Analgesia – reduced sensitivity to pain
- Opioids bring pain relief by interfering with the pain perception pathway in the nervous system
  - Spinal cord
    - Interfere with transmission of the pain messages between neurons - preventing them from reaching the brain
    - Interrupt the descending message from the brain to the spinal cord
  - Brain
    - Emotional and hormonal aspects
    - Changes the subjective message received; still feel the pain but it no longer bothers you
Tolerance

- **Chronic use**
  - Leads to changes in the nervous system
- **Develops quite rapidly**
- **Does not occur for all pharmacological effects to the same extent or at the same rate**
  - No or minimal tolerance to constipating effects or miosis

- **Significant loss of tolerance may occur as quickly as three days without methadone**
  - After 5 days the body has essentially eliminated the drug and any drug intake should progress as if starting a dosing program
Tolerance

- **Mechanisms responsible for tolerance**
  - Increased rate of metabolism
    - Drug disposition tolerance
      - An increase in liver enzymes
  - Classical conditioning (effect of environmental cues)
  - Changes in nerve cells
    - Adaptive mechanism to return the organism to homeostasis
      - Gradual increase in cell firing rate
      - cAMP production increases to pre-opioid level

- **Example:** 50 mg has proven fatal; 180 mg/day in MMT; up to 780 mg/day in rare instances
Cross-tolerance

- Exists among all opiates
- Differences in receptor subtypes
  - Selective agonist for μ-receptor will reduce the effectiveness of other μ-receptor agonists but only minimally reduce κ-agonist activity
- Patients tolerant to another opioid may be incompletely tolerant to methadone
- Deaths have occurred from “physician induced” overdose
Withdrawal
Symptoms generally develop more slowly and are less acutely severe than those of morphine and heroin withdrawal, but are usually more prolonged.

<table>
<thead>
<tr>
<th>Acute Action</th>
<th>Withdrawal Sign</th>
</tr>
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<tbody>
<tr>
<td>Analgesia</td>
<td>Pain and irritability</td>
</tr>
<tr>
<td>Respiratory depression</td>
<td>Panting and yawning</td>
</tr>
<tr>
<td>Euphoria</td>
<td>Dysphoria and depression</td>
</tr>
<tr>
<td>Relaxation and sleep</td>
<td>Restlessness and insomnia</td>
</tr>
<tr>
<td>Tranquilization</td>
<td>Fearfulness and hostility</td>
</tr>
<tr>
<td>Decreased blood pressure</td>
<td>Increased blood pressure</td>
</tr>
<tr>
<td>Constipation</td>
<td>Diarrhea</td>
</tr>
<tr>
<td>Pupil constriction</td>
<td>Pupil dilation</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Hyperthermia</td>
</tr>
<tr>
<td>Drying of secretions</td>
<td>Tearing, runny nose</td>
</tr>
<tr>
<td>Reduced sex drive</td>
<td>Spontaneous ejaculation</td>
</tr>
<tr>
<td>Flushed and warm skin</td>
<td>Chilliness and “gooseflesh”</td>
</tr>
</tbody>
</table>
Withdrawal

  - Evaluated cognitive function during the first few weeks of abstinence
  - Subjects with opioid dependence
  - Performed significantly worse in tests measuring complex working memory, executive function, and fluid intelligence
  - Correlation with days in withdrawal
  - Indicated a general deficit in higher order cognition
Pharmacokinetics

The action of the body on the drug
  - Absorption, Distribution, Metabolism, and Elimination

- Good Oral bioavailability = 36 – 99%
  - Peak plasma levels 1-4 hours
- Volume of distribution = 4-6.7 L/kg
- Long Half-Life 8-59 hours
- Metabolism: liver
  - CYP450: 2B6, 2C19, 3A4 (primary), 2C9, 2D6 (minor)
- Excretion: feces, urine
Pharmacokinetics

- **Good Oral bioavailability 36-99%**
  - Compared to morphine at 20-40%
- **Large Volume of Distribution**
- **Long Half-Life 8-59 hours**
  - Compared to morphine at avg of 3 hours

Due to its chemical structure
Almost as effective as IV

Large VD =distribution into tissues; lipid soluble
Less reports of a “rush” effect

Allows the drug to be given once daily
Much longer than the analgesic effect, typically 6 – 8 hours
Risk of additional doses being consumed for pain leading to respiratory depression
Pharmacokinetics

- **Metabolism: liver**
  - Enzymes - CYP450: 1A2, 2B6, 2C19, 3A4 (primary), 2C9, 2D6 (minor),

- **Drug-drug interactions**
  - These enzymes are used to metabolize large numbers of drugs
  - 3A4 – approximately 2/3 of the PDR
  - Competitors – two drugs using the same enzyme
  - Inhibitors = generally will reduce metabolism; increase Methadone levels
    - Examples: Zithromax, Erythromycin, Sertraline, Cimetidine, Prilosec, acute alcohol
Pharmacokinetics

- **Metabolism: liver**
  - Enzymes - CYP450: 1A2, 2B6, 2C19, 3A4 (primary), 2C9, 2D6 (minor),

- **Drug-drug interactions**
  - **Inducers** = generally will result in more rapid metabolism decreasing effects of Methadone

  - Examples: Phenytoin, St. John’s Wort, Carbamazepine, abstaining chronic alcoholic

- **Isoenzyme 2D6 is subject to genetic polymorphism**
  - Rapid metabolizers and Slow metabolizers
Pharmacokinetics

- **Excretion:**
  - feces, urine
  - Saliva, beast milk, hair, amniotic fluid, nails

- **Primary metabolites:**
  - EDDP - inactive
  - EMDP - inactive

- **Minor metabolites:**
  - Methadol - active
  - Normethadol - active

- **Additional metabolites have been identified**
Blood Toxicology

- **Acute Oral Dosing (15-120 mg)**: 0.075 – 0.86 mg/L
- **Chronic Oral Dosing (100 - >200mg)**: 0.57 – 1.06 mg/L
- **DUI**: 0.05 – 0.64 mg/L
- **Med Examiner**: 0.02 – 5.3 mg/L

- Concentration ranges of subject groups overlap
- Determination of impairment from blood toxicology alone is not possible
POTENTIAL DEFENSES IN METHADONE DUID CASES
Defense:
The impairment is not due to the Methadone but to the pain I am suffering

Scientific Literature

- Pain deteriorated performance more than oral opioid treatment in cancer patients
- Increase in reaction time correlated to pain intensity and not opioid dose
- Ability to maintain lane position impaired in pain patients compared to controls
Defense:
The impairment is not due to the Methadone but to the pain I am suffering

Documentation

- **DRE Evaluation**
  - Document performance impairment at the time of driving
  - Evaluation questions: Are you sick or injured? and Are you under the care of a physician?

- **Comprehensive toxicology**
  - Documentation of prescribed drugs and no other impairing drugs
Defense:
The impairment is not due to the Methadone but to the other psychological disorders

Scientific Literature

- Performance decrements better explained by:
  - Sociodemographic factors
  - Social and personality disorders
  - Implications of heroin use
    - Higher rate of alcohol dependence
    - Brain damage due to hypoxia in previous overdoses
    - Head injuries that occurred in drug impaired state
Defense:
The impairment is not due to the Methadone but to the other psychological disorders

Documentation

- DRE Evaluation
  - Document performance impairment at the time of driving
  - Evaluation questions: Are you sick or injured? Are you under the care of a physician? Do you have any physical defects?

- Comprehensive toxicology
  - Documentation of prescribed drugs and no other impairing drugs
Defense:  
In MMT and on a stable dose of Methadone

Scientific Literature

- No significant performance decrements in laboratory tests:
  - Memory test
  - Vigilance and simple reaction time
  - Visual functioning
  - Compensatory, pursuit, and critical tracking
- No decrement in maintaining lane position, speed and reaction time in a 75 minute driving simulator test
- Literature Reviews that conclude that opioids do not impair driving in the opioid-dependent person
Defense:
In MMT and on a stable dose of Methadone

Documentation

- **DRE Evaluation**
  - Document performance impairment at the time of driving
  - Evaluation questions: Are you under the care of a physician?

- **Methadone dose**
  - Inquire how long the subject has been on the current dose
  - Scientific Literature
    - Impairment with 30% increase in dose

- **Scientific literature**
  - Impaired psychomotor speed, decision making, inhibitory mechanisms, logical reasoning
Defense:
In MMT and on a stable dose of Methadone

Documentation

- Comprehensive toxicology
  - Documentation of no other drugs being consumed
Methadone and Polydrug Use

- Search for Methadone only cases:
  - “I put the request out to all 400+ DREs and so far all methadone cases involved other drugs” – Dan Mulleneaux, Region I representative to TAP
  - “Not one of the cases came back Methadone alone” – NYSP Sgt. Doug Paquette – Region III TAP Representative
Methadone and Polydrug Use

- 2007 - 52 cases (3%) positive
- Blood level ranges = 29-836 ng/ml
- 73% males
  - 18-81 y; Avg 38
- 27% females
  - 21-44 y; Avg 31
- 79% polydrug use
  - 19 (37%) w/Benzo
  - 17 (33%) w/Cannabis
  - 8 (15%) w/Cocaine
  - 8 (15%) w/Opioid
Methadone and Polydrug Use in DWI Cases
Southwestern Institute of Forensic Sciences

- 52% Combo Drugs
- 19% Methadone Only
- 14% COOH-THC Only
- 13% Benzos Only
- 5% Opiates Only
- 6% Contain CNS Stimulants
WA - High Prevalence of Other Drugs (98% - drivers)
WA DRE Cases
Methadone only significant finding

- 32 cases
  - Males – 75%
  - Age – 40 (mean)  42 (median)
  - Methadone concentration:
    - 0.26 mg/L mean  0.27 mg/L median
  - 42% involved in a MV collision
    - Most commonly involved collisions with parked cars
  - 45% arrested for erratic driving (significant weaving)
    - (1/3 of which were so bad, reported by cell phone callers)
## WA DRE Cases
### Methadone & DRE Matrix

<table>
<thead>
<tr>
<th></th>
<th>Methadone Drivers</th>
<th>DRE Matrix Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupil Size</td>
<td>Constricted in all 3 lighting conditions</td>
<td>✓</td>
</tr>
<tr>
<td>Reaction To Light</td>
<td>Little to none</td>
<td>✓</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>Flacid</td>
<td>✓</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>Widely Variable</td>
<td>Below Normal</td>
</tr>
<tr>
<td>Pulse</td>
<td>Widely Variable</td>
<td>Below Normal</td>
</tr>
<tr>
<td>Body Temp</td>
<td>Normal</td>
<td>Below Normal</td>
</tr>
<tr>
<td>Slurred Speech</td>
<td>~ 50%</td>
<td>✓</td>
</tr>
<tr>
<td>Droopy Eyelids</td>
<td>~ 75%</td>
<td>✓</td>
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WA DRE Cases
DRE Testing Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk and Turn</td>
<td>5/8</td>
</tr>
<tr>
<td>One Leg Stand</td>
<td>3/4</td>
</tr>
<tr>
<td>Romberg Balance</td>
<td>Avg 2” sway</td>
</tr>
<tr>
<td>Time Estimate</td>
<td>Widely Variable</td>
</tr>
<tr>
<td>Finger to Nose</td>
<td>Generally Poor performance</td>
</tr>
</tbody>
</table>

Admissions: 78% Admitted using methadone
31% Opiate Treatment Program
34% Chronic Pain
INDIVIDUAL CASE EXAMPLES
Pain Patient

- 35 year old male
- Collided with vehicle in same lane of travel
- Officers noted defendant sitting in his vehicle “nodding off”
- Repeatedly asked the same questions
- DRE noted “slurred speech”, watery eyes and droopy eyelids
Pain Patient

- Romberg Balance: 2-3 inches of sway
  - Subject asked to repeat test (total 4)
  - Estimated 30 secs as:
    - 36, 45, 10, 76 seconds

- Walk and Turn - 6/8 clues
  - Legs noticeably shaking

- One Leg Stand – 3/4

- Finger to Nose - 5/6
Pain Patient

- **Admissions**
  - 30 mg Methadone – chronic pain
  - 3 ½ hours before stop

- **Blood Toxicology:** 0.27 mg/L methadone
  - EDDP, caffeine, nicotine

- **Outcome**
  - Physician testified that methadone does not impair driving
  - Convicted DUID
20 year old male, single vehicle accident
Subject claimed he “slid off the road due to snow and ice” (Actual temp - 56° F.)
Subject had thick, slurred speech, staggered and had difficulty standing
Described as “on the nod”
Pez Dispenser

- Romberg Balance – swayed 3” front to back and 2” side to side
  - “Head tilted back so far he looked like a Pez Dispenser”
- Walk & Turn – Stumbled during instructions twice, missed heel to toe every step, stopped after the turn (8/8)
- One-Leg-Stand – repeatedly put his foot down and held onto wall for balance (4/4)
- Finger to nose – only touched his nose 1/6 (with his knuckle) (6/6)
Pupil size:
- Room Light: 3.0 mm (within normal)
- Darkness: 3.0 mm (constricted)
- Direct Light: 2.5 mm (within normal)

Little to no reaction to light

Pulse: 54, 56, 56 (normal = 60-90)

BP: 128/68 (normal 120-140/60-90)

Muscle Tone: Flaccid
Pez Dispenser

- Admissions
  - Unknown amount of methadone – provided by a friend

- Blood Toxicology: 0.05 mg/L methadone
  - EDDP

- Pleaded guilty to DUI Drugs
Implausible Deniability

- 36 year old female, subject of multiple cell phone callers to 911
- Had struck a guardrail wiping out entire right side of her car
- Weaving back and forth across multiple lanes
- Disoriented and unaware she had been involved in a collision
- DRE noted droopy eyelids, and constricted pupils
- Subject was very agitated
Implausible Deniability

- Romberg balance – 2” circular sway and estimated 21 seconds to be 30
- Walk & Turn – Unable to stand without sway, 10 steps up, 9 back, 8/8 clues (talked non-stop)
- One-Leg-Stand – swayed, hopped, put foot down, used arms 4/4
- Finger to nose – 4/6
Implausible Deniability

- **Pupil size:**
  - Room Light: 2.5 mm (within normal)
  - Darkness: 3.0 mm (constricted)
  - Direct Light: 2.0 mm (within normal)
- Little to no reaction to light
- **Pulse:** 92, 96, 96 (normal = 60-90)
- **BP:** 156/108 (normal 120-140/60-90)
- **Muscle Tone:** Normal
Implausible Deniability

- **Admissions**
  - Methadone at 7:30 am (15 hours prior to stop)
    Opiate treatment program – claimed no one at the clinic told her it would impair her
    She continued to insist that she was not impaired
- **Blood Toxicology:** 0.35 mg/L methadone
  - EDDP, caffeine
- **Convicted of DUI Drugs**
Asleep at the Wheel

- 53 year old female, subject of a “Drunk Driver” to 911
- **Witness:**
  - Driver cut her off on a bridge
  - Pulled over - Still there 1.5 hours later
  - Slumped over the wheel
  - Car still on and in drive
- **Initial officer:**
  - Difficulty keeping her eyes open
  - Slurred Speech
  - HGN present; failed walk and turn
- BrAC = 0.00%
Asleep at the Wheel

- Romberg balance – 4” sway front to back and 3” sway side-to-side; estimated 34 seconds to be 30
- Walk & Turn – Unable to stand without sway, missed heel-to-toe on almost all steps, used arms for balance
- One-Leg-Stand – swayed, put foot down, used arms – stopped for safety on both legs
- Finger to nose – missed touching her fingertip to nose on all six attempts
Asleep at the Wheel

- Eyes - Bloodshot
- HGN (immediate onset) and VGN
- Pupil size:
  - Room Light: 4.5 mm (within normal)
  - Darkness: 5.0 mm (within normal)
  - Direct Light: 3.0 mm (within normal)
- Little to no reaction to light
- Pulse: 102, 98, 100 (elevated; normal = 60-90)
- BP: 114/82 (low; normal 120-140/60-90)
- Muscle Tone: Flaccid
Asleep at the Wheel

- **Admissions**
  - One 10 mg Methadone at 11:00 a.m. (7 hours prior)
  - One 5 mg Klonopin at 4 or 5 p.m. (2-3 hrs prior)
  - Got pills from another person

- **DRE Opinion:** CNS Depressant

- **Toxicology:** Urine
  - Positive – Methadone & Quetiapine (Seroquel)
  - Clonazepam was not detected in the urine
    - Elevated negative screen was not confirmed

- **Active DUID Case**
Common Poly

- 50 year old male
- Auto Accident
  - Struck car waiting to make a left turn
- Responding Officer:
  - Shaking
  - Droopy, Reddened Eyes
  - Lethargic - Slow to answer questions
- Initial SFSTs:
  - No HGN or VGN
  - Walk and Turn – Failed test; Body Tremors
  - One Leg Stand – Discontinued for safety
Common Poly

- Romberg balance – 2” circular sway, estimated 15 seconds to be 30, eyelid and body tremors
- Walk & Turn – Could not maintain balance, missed heel-to-toe on almost all steps, used arms for balance
- One-Leg-Stand – swayed, put foot down, used arms; leg tremors
- Finger to nose – missed touching fingertip to nose on all six attempts; eyelid and leg tremors
Common Poly

- Eyes – watery with reddened conjunctiva
- Pupil size:
  - Room Light: 2.5 mm (within normal)
  - Darkness: 5.0 mm (within normal)
  - Direct Light: 1.5 mm (constricted)
- Normal reaction to light
- Pulse: 96, 104, 100 (normal = 60-90)
- BP: 192/84 (normal 120-140/60-90)
- Muscle Tone: Normal
Common Poly

- Admissions: Furosemide (Lasix)
- Controlled Substance in car: Marijuana
- DRE Opinion: Cannabis
- Urine Toxicology:
  - Methadone
  - 7-aminoclonazepam
- Active DUID Case
Non-compliant MMT

- 32 yo, male
- Subject leaves MMT clinic; ~10 mins. later hits and kills a 69 year old male pedestrian who is crossing street.
- Subject Statements:
  - Never saw the pedestrian
  - Had placed a coffee between his legs and when he looked up the pedestrian was in his windshield
- Witnesses
  - Coming from both directions could see pedestrian
Non-compliant MMT

Background about subject:
- Using drugs for 22 years since 11 yo
- Drugs of abuse-
  - Began with vicodin, progressed to cocaine, then oxycodone or dilaudid via IV, and finally heroin 2-3X’s/day.
- Treatment-
  - 1995-1996
  - 2004-2005
  - Sept ’04 – 42 days
  - Nov ’04-July ’05
  - July ’05-2007
Non-compliant MMT

- Day of Accident:
  - No one notes anything unusual about subject; does not appear impaired
  - Subject states that methadone does not have any affect on him and that he did not feel tired
  - ~7 hours after the crash subject is noticed falling asleep in lobby at PD
  - Subject states that he smoked pot about 1 week ago
  - Subject’s attitude- very matter of fact showing little emotion
  - Subject signs medical release forms
Non-compliant MMT

RED = Methadone dose when noncompliant – positive for additional drug
Non-compliant MMT

- **Blood Toxicology:**
  - Alcohol - None Detected
  - Delta-9-THC = Negative
  - Delta-9-Carboxy-THC = 18 ng/ml
  - Methadone = 754 ng/ml

- **Case Disposition – Grand Jury**
  - Tragic accident but no crime had been committed
Summary of Case Examples

- Impairment may occur in individuals under a doctor’s care
- Low dose in a naïve individual can be impairing
- Patients may not be properly informed
- Methadone patients may be non-compliant
- Polydrug use is common
- Methadone in DUID – prescribed for pain, MMT and through diversion
In Conclusion

- Methadone can impair performance
- Factors that must be considered:
  - Reason for Use – Pain, MMT, Diversion
  - Health of subject
  - History of Use – a recent change?
  - Tolerance
  - Polydrug Use
Impairment can not be determined by quantitative blood toxicology alone.

Paired with the observations of a DRE, a determination of impairment can be made.
Thank you

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  - Dr. Michael Wagner, NH
  - Colleen Scarneo, NH
  - Dr. Jeanne Beno, NY
  - Jennifer Limoges, NY
  - Dr. Julia Pearson, VA
  - Dr. Fiona Couper, WA
  - Laura Liddicoat, WIS

- **DREs:**
  - Dan Mulleneaux, AZ
  - Sgt. Doug Paquette, NYSP
  - Sgt. Joe Reff, Watertown PD, NY
  - Alan Bell, Niskayuna PD, NY