

Urine Drug Testing of Pain Patients: Licit and Illicit Drug Patterns and Prevalence

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Outline

Urine Drug Testing of Pain Patients: Licit and Illicit Drug Patterns and Prevalence*

- Pain management and monitoring
- Urine drug testing (UDT)
- Database of confirmed results
- Licit and illicit drug patterns

*Note: This information was presented at SOFT, 2007, and is based on Cone, et al JAT, in press, 2008

Chronic Pain & Treatment

- Chronic pain is a problem of immense proportions
- One in 5 adult Americans suffer
 - Accounts for 21% of all ER visits
- In pain management settings, 90% of patients are prescribed opioids for chronic pain
 - Polymedication is common
 - Benzodiazepines
 - Hypnotics
 - Stimulants
- Physical dependence and tolerance should be expected
- But...maladaptive behavior changes associated with “addiction” may also occur

Need for Monitoring Pain Patients

- Fishbain et al (1992) found addiction in pain population ranges from 3.2% to 18.9%
- Role of urine toxicology
 - Compliance with prescribed medication(s)
 - Non-authorized medications
 - Diversion to an illegal market
 - Illicit drug use
 - Toxicity (overdose, drug-drug interactions)
 - Physician liability
- But...there is little information available on UDT in this population

Study Goals

- Evaluate urine drug testing (UDT) results in large database of pain patients
- Determine the prevalence of licit and illicit drug use in this unique population

Data Source for Study: UDT Pain Database

- 13,948 PainComp specimens collected during 2006 from pain patients in 31 clinics from TN, WV, KY, OH, FL, IN
- 10,922 confirmed specimens (78.3% positivity rate)
- Screened (IA) and confirmed (MS)
- Confirmation assays for 39 analytes
 - 32 analytes detected and measured
- Quantitative results collated into “Pain Database”

Database Analysis

Main database
10,922 patients

11 Drug groups
15,859 positives

Group analytes
27,197 positives

10,922 patients

Amphetamines
Barbiturates
Benzodiazepines
Cannabis
Carisoprodol
Cocaine
Fentanyl
Meperidine
Methadone
Opioids
Propoxyphene

Amphetamine
Methamphetamine
MDMA
MDA
Phentermine
p-Methoxyamphetamine
MDEA

Results: Overall Drug Prevalence

- 10,922 Patients, 15,859 Specimens with drug group positives

Drug	# Positives
Opiates	8986
Benzodiazepines	2397
Methadone	1209
THCCOOH	967
Cariso	611
Fentanyl	458
Propoxyphene	385
Cocaine	310
Barbiturates	308
Amphetamines	160
Meperidine	58

Opioid Prevalence in Pain Patients

- N=10922 specimens; 18355 positives

Drug	Percentage
Hydrocodone	52.6%
Hydromorphone	33.8%
Dihydrocodeine	20.9%
Oxycodone	18.9%
Oxymorphone	14.9%
Morphine	9.7%
Methadone	9.7%
Fentanyl	4.2%
Propoxyphene	1.7%
Codeine	1.2%
Meperidine	0.3%

Use of Multiple Opioids

(fentanyl, meperidine, methadone, hydro-opioid,
oxy-opioid, and propoxyphene)

- Single use: 86.2% of all positive opioid results (N = 8715)
- Two opioids: 12.5% (N = 1264)
- Three opioids: 1.2% (N = 121)
- Four opioids: 0.1% (N = 10)

Interesting Drug Combinations

Combination of Two Opioids	N
HydOp + OxyOp	292
HydOp + MTD	138
HydOp + OxyOp + Benzos	108
HydOp + Fent	94
OxyOp + MTD	83
HydOp + Prop	77
OxyOp + Fent	54
HydOp + OxyOp + Cann + Benzos	18
HydOp + Fent + Benzos	17
MTD + Fent	12
HydOp + OxyOp + Barbs + Benzos	6
HydOp + OxyOp + Coc + Cann	5
HydOp + Fent + Amps + Benzos	2

- Abbreviations: HydOp = hydrocodone/hydromorphone; OxyOp = oxycodone/oxymorphone; MTD = methadone; Fent = fentanyl; Prop = propoxyphene; Cann = cannabis; Benzos = benzodiazepines; Barbs = barbiturates; Amps = amphetamines)
- Cone, et al JAT, in press, 2008

Interesting Drug Combinations

Combination of Four Opioids	N
OxyOp + MTD + Prop + Fent + Car/Mep	1
HydOp + OxyOp + MTD + Fent + Amps	1
HydOp + OxyOp + MTD + Fent + Benzos	1
HydOp + OxyOp + MTD + Prop + Car/Mep	1
HydOp + OxyOp + MTD + Fent + Benzos	1

Interesting Drug Combinations

Combination of Opioids and Other Classes	N
HydOp + Benzos	824
OxyOp + Benzos	295
HydOp + Car/Mep	161
HydOp + Barbs	89
Fent + Benzo	20
HydOp + OxyOp + MTD + Benzos	3
OxyOp + Fent + MTD + Car/Mep	2
HydOp + MTD + Fent + Benzos + Cann + Car/Mep	1

Illicit Drug Use*

Drug	# Positive Specimens	% Positive
Cannabis	967	8.85
Cocaine	310	2.84
Methamp	41	0.38
Ecstasy	4	0.04
Sum	1318	12.1

*If methamphetamine is not included, there were a total of 1195 positive specimens, giving an overall illicit prevalence rate of 10.9%

Cone, et al JAT, in press, 2008

Interesting Drug Combinations

Illicit Drugs and Combinations	N
HydOp + Cann	196
Cann	193
HydOp + Cann + Benzos	65
OxyOp + Cann	54
Coc	46
HydOp + Coc	43
Benzos + Cann	42
OxyOp + Benzos + Cann	37
MTD + Cann	35
HydOp + Cann + OxyOp	25
Cann + Coc	24
OxyOp + Benzos + Coc	19
HydOp + Cann + Car/Mep	18
HydOp + Cann + Benzos + OxyOp	18

Bizarre Illicit Combinations!

Combinations	N
Benzos + Cann + Coc + HydOp + OxyOp + MTD + Car/Mep	1
Benzos + Cann + Coc + OxyOp + Car/Mep	1
Benzos + Cann + HydOp + MTD + Fent + Car/Mep	1
Coc + HydOp + OxyOp + Fent + Car/Mep	1
HydOp + Amps + Benzos + Coc + Fent + OxyOp	1
Ecst + Benzos + Cann + Coc + OxyOp + MTD	1
Ecst + Cann + HydOp	1
Amps + Coc + HydOp	1
Barbs + Benzos + Cann + Car/Mep	1
Barbs + Coc	1

- Cone, et al JAT, in press, 2008

Drug Group Patterns

Amphetamines (within-group analysis)

- N = 160 specimens; 204 positive analytes

Prevalence & Mean Concentration

Analyte	N	ng/mL
Amphetamine	121	10163
Methamphetamine	41	15674
Phentermine	35	49376
MDA	4	1005
MDMA	3	1197

Combinations (N=160)

Combinations	N
Amphetamine	82
Meth/Amp	37
Phentermine	33
MDMA/MDA	3
Meth	2
Meth/Amp/Phent	2
Meth	2

Barbiturates (within-group analysis)

- N = 308 specimens; 310 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
Butalbital	304	1,521
Secobarbital	5	2,986
Butabarbital	1	559

Combinations (N = 611)

Analyte(s)	N
Butalbital	302
Secobarbital	4
Buta/Seco	1
Buta/Butalbital	1

- Cone, et al. JAT, in press, 2008

Benzodiazepines (within-group analysis)

- N = 2397 specimens; 4681 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
Oxazepam	1,522	1,343
Temazepam	1,283	1,981
Nordiazepam	860	443
α -OH-Alprazolam	773	495
Clonazepam	160	492
Lorazepam	83	1,405

Combinations (N = 2,397)

Analytes	N
Nor/Ox/Tem	691
α -OH-Alp	594
Ox/Tem	357
Ox	236
Clon	124
Nor/Ox/Tem/ α -OH-Alp	58
Ox/ α -OH-Alp	44
Tem	43
Nor/Ox	38
Nor/Tem	37
Ox/Tem/ α -OH-Alp	35
Lor	31
Lor/Ox/Tem	12
Tem/ α -OH-Alp	11
Lor/Nor/Ox/Tem	10
Others <10	76

- Cone, et al. JAT, in press, 2008

Cannabis (within-group analysis)

- N = 967 specimens; 967 positive analytes

Prevalence and concentration data

THCCOOH	N
N	967
Mean, ng/mL	177
SEM, ng/mL	16
Median, ng/mL	40
Range, ng/mL	2 – 11,554

Combinations (N = 967)

Analyte	N
THCCOOH	967

- Cone, et al. JAT, in press, 2008

Carisoprodol (within-group analysis)

- N = 611 specimens; 849 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
Meprobamate	575	30,226
Carisoprodol	274	7,893

Combinations (N = 611)

Analyte(s)	N
Meprobamate	336
Car/Meperidine	239
Carisoprodol	36

- Cone, et al. JAT, in press, 2008

Cocaine (within-group analysis)

- N = 310 specimens; 310 positive analytes

Prevalence and concentration data

BZE	N
N	310
Mean, ng/mL	18,322
SEM, ng/mL	2,508
Median, ng/mL	1,043
Range, ng/mL	50 – 425,055

Combinations (N = 310)

Analyte	N
BZE	310

- Cone, et al. JAT, in press, 2008

Fentanyl (within-group analysis)

- N = 458 specimens; 458 positive analytes

Prevalence and concentration data

Fentanyl	N
N	458
Mean, ng/mL	87
SEM, ng/mL	9
Median, ng/mL	23
Range, ng/mL	1 - 2382

Combinations (N = 458)

Analyte	N
Fentanyl	458

- Cone, et al. JAT, in press, 2008

Meperidine (within-group analysis)

- N = 58 specimens; 76 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
Meperidine	36	3,490
Nomeperidine	40	3,086

Combinations (N = 1,209)

Analyte(s)	N
Nomeperidine	22
Meperidine	18
Mep/Nor	18

- Cone, et al. JAT, in press, 2008

Methadone (within-group analysis)

- N = 1209 specimens; 2189 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
EDDP	1,134	6,561
Methadone	1,055	4,167

Combinations (N = 1,209)

Analyte(s)	N
Methadone/EDDP	982
EDDP	154
Methadone	75

- Cone, et al. JAT, in press, 2008

Opiates (within-group analysis)

- N = 8,996 specimens; 16,615 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
Hydrocodone	5,748	2,953
Hydromorphone	3,695	1,062
Dihydrocodeine	2,280	613
Oxycodone	2,068	7,599
Oxymorphone	1,629	4,930
Morphine	1,060	25,800
Codeine	135	12,180

Combinations (N = 8,996)

Analyte(s)	N
Hydrocodone	2,089
HC/HM	1,227
HC/HM/DHC	1,218
All others	1,129
OC/OM	1,108
HC/DHC	632
HM	552
OC	434
MOR	395
MOR/HM	212

- Cone, et al. JAT, in press, 2008

Propoxyphene (within-group analysis)

- N = 385 specimens; 538 positive analytes

Prevalence and mean concentration

Analyte	N	Mean, ng/mL
Propoxyphene	191	1558
Norpropoxyphene	347	11,705

Cone, et al. JAT, in press, 2008

Combinations (N = 385)

Analyte(s)	N
Propoxyphene	38
Norpropoxyphene	194
Pro/Norpropoxyphene	153

Conclusions

- Comprehensive UDT provides physicians with essential information in monitoring and care of pain patients
- Many physicians/patients administer multiple drug combinations
 - Opioid/opioid combinations
 - Opioid/other drug combinations

Conclusions (continued)

- Significant numbers of patients also administer illicit drugs
 - Evidence of illicit drug use:
 - Cannabis; 8.9%; N = 967 specimens
 - Cocaine; 2.9%; N = 310 specimens
 - Ecstasy; <0.1%; N = 4 specimens
- UDT for pain patients requires sensitive laboratory test procedures for broader range of drugs than commonly used in other settings, e.g., workplace
- Cone, et al JAT, in press, 2008