TOPICS OF DISCUSSION

- Collection/Chain of Custody
- Sample Media Comparison / Detection
- Dilution/Adulteration/Substitution
- Ethyl Glucuronide
- Opiates
- Benzodiazepine
- THC New Usage
- New Drug Trends
CHAIN OF CUSTODY

- Donor verification:
  - Picture ID
  - Signature on CCF
  - Signature on bottle label

- TASC CST documentation:
  - Time of Collection
  - Collection Observed and Temperature Checked

- Signed by lab staff upon receipt into laboratory
**URINE COLLECTION**

- Client’s photo ID verified and signs log book. CCF is initiated.
- ID verified by CST at restroom
- Restroom for visual observation
- CST verifies CCF with client after sample collected
- Security seal applied in client’s presence
- Client signs security seal on container & CCF
- Sample placed in secure storage
HAIR FOLLICLE

- Client’s photo ID verified and signs log book.
- Client’s paperwork is filled out by donor
- CST lays out all supplies & explains the procedures
- CST sanitizes supplies in front of client
- CST collects 90-120 strands of hair (samples from 3 different spots on the crown)
- CST places samples on the foil in front of the client
HAIR FOLLICLE

- CST wraps hair sample in the foil
- CST shows the client the envelope to confirm it is empty and places the hair in the envelope.
- CST closes the envelope and has the client initial and date it verifying it is their sample.
- CST places the chain of custody and sample into the bag and seals it in front of the client.
- CST gives the client a copy of the chain of custody that was put with the sample.
- Sample placed in secure storage
ORAL FLUID

- Donor’s photo ID verified and signs log book. CCF is initiated.
- CST collects all supplies & explains testing procedures.
- CST will fill out donors information on the test tube.
- CST opens a sealed pouch containing the oral swab, opens the red cap, hands the non absorbent end of the swab to the client to put in their mouth. CST will wait until blue line fully appears on the indicator.
- CST will take the sample and place it back in the test tube and put the red cap on it.
- CST will put paperwork and sample into the sample bag and seal it in front of the client.
- CCF sticker is placed over top of the container and signed by client then sealed in bag. Sample placed in secure storage.
SAMPLE MEDIA / DETECTION
SAMPLE MEDIA

Various sample media types available to implement a drug abuse monitoring program

- Hair, Oral Fluid, and Urine - most common
- Blood and Sweat - uncommon

Each media type has its advantages/disadvantages
HAIR FOLLICLE

Detection times are: Head hair: 14-90 days prior
Body hair: 30-365 days prior

- Pros
  - Effective baseline test – Unknown drug use history
  - Adulteration difficult

- Cons
  - Not useful for routine monitoring since the drug use cannot be pin-pointed
  - Limited test menu
  - Head hair may not be available/ Potential issue with treated hair
  - May not pick up a single drug use
ORAL FLUID

Detection time is 12-36 hours/ 6-8 hours for THC

- **Pros**
  - Samples may be collected in the field and does not require same gender collection.
  - If its collected correctly it is difficult to adulterate
  - Is recommended for clients that may be on certain medications or for medical reasons (Dialysis/catheter)

- **Cons**
  - Short detection period
  - Ineffective for THC and EtG Detection
  - Moderate cost
URINE

Detection time is 24-72 hours

- **Pros**
  - Ability to split the sample for additional testing
  - Industry standard
  - Long history of legal acceptance
  - Broad, cost effective menu

- **Cons**
  - Requires visually observed collection to avoid adulteration/substitution
  - Potential for specimen dilution/adulteration in vivo and in vitro
## DETECTION TYPES FOR EACH MEDIA

<table>
<thead>
<tr>
<th>Media</th>
<th>Approximate Detection Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>24-72 hours</td>
</tr>
<tr>
<td>Oral Fluid</td>
<td>12-36 hours / 6-8 hours THC</td>
</tr>
<tr>
<td>Hair</td>
<td>Head hair: 14-90 days prior</td>
</tr>
<tr>
<td></td>
<td>Body hair: 30-365 days prior</td>
</tr>
<tr>
<td>Blood</td>
<td>8-36 hours</td>
</tr>
<tr>
<td>Sweat</td>
<td>1-4 weeks (period patch is worn)</td>
</tr>
</tbody>
</table>
URINE DETECTION TIMES

Stimulants:
Amphetamines, Cocaine, Ecstasy, Bath Salts 24-72 hrs

Narcotics / Narcotic Analgesics:
Methadone, Opiates, Propoxyphene 24-72 hrs

Sedative Hypnotics
Barbiturates, Benzodiazepines 24-72 hrs / 2-6 wks*

Hallucinogens:
Marijuana 24-72 hrs / 2-6 wks*
PCP, LSD 2-5 days

Depressants:
Alcohol 1-12 hours
Ethyl Glucuronide (EtG) 8-72 hours

*It is always recommended to order a GCMS or a LC-MS/MS confirmation if a client is contesting the result.
MEDIA STRATEGIES

- **Hair**
  - Use to establish a “baseline” at beginning of program
  - Use if client misses over 30 continuous days of testing

- **Urine**
  - Random Schedule: Variable from 1x/month to 2x/week
  - Fixed Schedule (2x/week): Every Mon/Thu or Tue/Fri
  - Intensive: Every Mon/Wed/Fri

- **Oral Fluid**
  - Medical reasons (Dialysis / Catheter)
  - Testing 2x/week recommended
DILUTION/ADULTERATION/SUBSTITUTION
DILUTED

In vivo dilution is the most common method employed to circumvent a drug test.

**Principle:**

The ingestion of copious amounts of fluids prior to providing a urine sample in order to induce polyuria and ultimately lower the concentration of drugs in the bladder below the detectable limit.
EFFECTS OF WATER LOADING

Urine Production Rate After Water Loading

Urine Production (mL/min)

Time (min)

1 Liter
2 Liters
**DIURETICS**

- Natural diuretics are natural foods and herbs that induce the removal of excess fluids in the body by increasing urination.

- Caffeine, fruits and vegetables, fruit juices, some herbs like green tea.

- Diuretic drugs treat edema caused by disorders of the heart, kidneys, liver or lungs. They are used commonly in treatment of hypertension.
DILUTION INTERPRETATION

Intentional or Incidental Dilution?

- Is there a history of diluted samples?
- Are there occurrences of missed scheduled or random testing dates?
- Results of recent prior and subsequent samples “Positive” for drug(s)?
- Is the donor under medical supervision that dictates use of diuretics and/or high fluid intake?
ACTING ON DILUTED SAMPLES

- Establish a procedure for handling diluted samples
  - Define non-compliance
  - Determine ramifications

- Document donors understanding of compliance

- Consider *Negative Dilute* samples to be *Non-Compliant*
ADULTERATION

- Nationwide product distribution
  - Internet
  - Smoke shops or “head shops”
  - Mail order / magazine advertisements

- Offer next-day delivery with money-back guarantees

- Disseminate misinformation to perpetuate myths about drug testing

- Make exaggerated and unsubstantiated claims as to the efficacy of their products
COMMON METHODS

- Physical Tampering - Additives
- Specimen Substitution
- Devices
**THE ADULTERANT INDUSTRY**

- Nationwide product distribution
  - Internet, smoke shops or “head shops” and mail order / magazine advertisements
  - Offer next-day delivery with money-back guarantees
  - Will go off of myths to get people to buy their product.

<table>
<thead>
<tr>
<th>Physical Adulterants</th>
<th>Ingested Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acids</td>
<td>Vinegar</td>
</tr>
<tr>
<td>Surfactants (Soaps)</td>
<td>Pickle Juice</td>
</tr>
<tr>
<td>Fixatives (Glues)</td>
<td>Bleach</td>
</tr>
<tr>
<td>Oxidants</td>
<td>Drano</td>
</tr>
<tr>
<td></td>
<td>Water Pills</td>
</tr>
<tr>
<td></td>
<td>Detox Drinks</td>
</tr>
<tr>
<td></td>
<td>Herbal Teas &amp; Supplements</td>
</tr>
</tbody>
</table>
SPECIMEN SUBSTITUTION

- Dehydrated urine
- Non-urine liquids
- Also used in devices
DEVICES

- Concealed beneath clothing
- Utilizes drug-free urine
- Maintains proper urine temperature with heating pads or digital heating packs
- Typically sold to males; may include prosthetic penis
- Typically very expensive / single use only
- TASC has a very specific monitoring system and clients are instructed to use very detailed testing procedures
CONFISCATED DEVICES

The Whizzinator
CONFISCATED DEVICES

DIY Devices

![Image of DIY Devices]
CONFISCATED DEVICES

Female Devices
VISUAL MONITORING COLLECTION

Female Restroom

- One way mirror to view collection
- Bluing agent in toilets
- No hot water
- No chemicals in area
- Remove excessive clothing
- No items allowed in restroom

Male Restroom
ALCOHOL TESTING
URINE ALCOHOL

- Alcohol can be detected in the urine for approximately 12 hours.

- Potential for a false positive due to sugars in urine.
  - Diabetic individuals who are not being treated.
  - Bacteria in urine ferments sugars into alcohol.
  - Glucose test should be performed on a positive sample.
ETHYL GLUCURONIDE (ETG)

Ethyl Glucuronide (EtG) is a unique biological metabolite that is formed in the body after the consumption of ethanol, typically from drinking alcoholic beverages.

- Reported to be detectable in urine typically from 8-80 hours after ingestion, and 2-36 hours in blood

- EtG is detectable over a period roughly 5-6 times longer than traditional urine ethanol testing

- Detectable in oral fluid only a few hours longer than ethanol*

- EtG has also been isolated in hair follicles

*G.Heiseth, B. Yttredal, et.al. ; JATox: July 2010
**URINE ETG**

- EtG is realistically detectable for approximately 6-72 hours at the industry norm 500 ng/mL cutoff limit.
- Peak urine detection time is approximately 8 hours after ingestion event.
- Normal urinary EtG levels in abstainers are <10-80 ng/mL.
- Urinary metabolite Ethyl Sulfate (EtS) is also detectable as an additional biomarker.
- No direct correlation can be made between urine EtG and BAC (blood alcohol concentration).
- Impairment or intoxication cannot be determined.
HOW MUCH ALCOHOL DID MY CLIENT DRINK?

• It is **not** possible to determine the amount of EtG that will be produced from a measure of Ethanol (or vice versa) - Retrograde extrapolation **cannot** be performed.

• Metabolism of Ethanol and EtG and EtS is genetically determined - Variability between individuals could be a 200-fold difference!

• Age, gender, race, physical health, diet, metabolism, and time of sample collection are but a few significant variables that can affect EtG detected.
WHY TEST ETS?

- EtG can possibly disappear (or be degraded) in urine due to certain bacterial contamination of the sample.
- EtS is not degraded by common bacterial contaminants.
- EtG can be synthesized by bacteria (such as *E. coli*) in-vitro in the presence of alcohol (!)*
- Presence of both EtG and EtS is a strong indicator of alcohol consumption.
- Presence of EtS alone may indicate alcohol consumption in conditions where the sample is contaminated (UTI infection).

*A. Helander, et.al.; ClinChem: August 2007*
EXAMPLE ETG OBSERVATIONS

- Two non-alcoholic beers
  - EtG concentration after 12 hours: 93 ng/mL – Negative

- A teaspoon of communion wine
  - EtG concentration after 12 hours: 77 ng/mL – Negative

- Three 1 oz doses of Nyquil over 24 hours
  - EtG concentration after 12 hours: 246 ng/mL – Negative

*Compiled from various sources*
EXAMPLE ETG OBSERVATIONS

• Single Beer (4.5% Alcohol)
  ▪ Positive EtG above the 500 ng/mL cutoff level for 16 hours
  ▪ Concentration peaking at 4,000 ng/mL after 4 hours

• Three glasses of wine (12% Alcohol) consumed over 3 hours
  ▪ Positive EtG above the 500 ng/mL cutoff level for 32 hours
  ▪ Concentration peaking at 68,000 ng/mL after 14 hours

• Six shots of vodka over 3 hours
  ▪ ETG in the range of 10,000 ng/mL –100,000 ng/mL
  ▪ Peaked at 16 hours and detectable for 54 hours
HYGIENE PRODUCTS

- Hand sanitizer applied every 15 minutes for 8 hours
  - Maximum EtG of approx 50 ng/mL – Negative

- Gargling mouthwash 3 times a day for 5 days
  - Maximum EtG concentration of 117 ng/mL – Negative

- Gargling mouthwash 4 times a day for 78 hours
  - Maximum EtG level: 173 ng/mL - Negative
SUMMARY

- If usage is denied, confirmation is *Highly Recommended*
  - LC-MS/MS Quantification of EtG and EtS

- Avoid significant sanctions when:
  - EtG is confirmed below 500 ng/mL

- Consider Medical Conditions
  - Diabetics
  - Clients with Urinary Tract Infections

- Implement a Client Agreement to avoid incidental exposure
OPIATES
# OPIATES

<table>
<thead>
<tr>
<th>Prescription/Drug</th>
<th>Opiate</th>
<th>Parent Drug/Metabolite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heroin</td>
<td>Diacetylmorphine</td>
<td>6-MAM, Morphine, Codeine</td>
</tr>
<tr>
<td>Tylenol #3, #4</td>
<td>Codeine</td>
<td>Codeine, Morphine</td>
</tr>
<tr>
<td>MS Contin, Roxanol</td>
<td>Morphine</td>
<td>Morphine, Hydromorphone</td>
</tr>
<tr>
<td>Vicodin, Vicoprofen, Tussionex, H-C Tussive</td>
<td>Hydrocodone</td>
<td>Hydrocodone, Hydromorphone</td>
</tr>
<tr>
<td>Dilaudid</td>
<td>Hydromorphone</td>
<td>Hydromorphone</td>
</tr>
<tr>
<td>Oxycontin, Percodan, Percoset, Roxicet</td>
<td>Oxycodeone</td>
<td>Oxycodeone, Oxymorphone</td>
</tr>
<tr>
<td>Opana</td>
<td>Oxymorphone</td>
<td>Oxymorphone</td>
</tr>
</tbody>
</table>
BENZODIAZEPINES
## BENZODIAZEPINES

<table>
<thead>
<tr>
<th>Prescription</th>
<th>Benzodiazepine</th>
<th>Parent Drug/Metabolite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versed</td>
<td>Midazolam</td>
<td>Midazolam, Hydroxymidazolam</td>
</tr>
<tr>
<td>Prosom</td>
<td>Estazolam</td>
<td>Estazolam, Hydroxyestazolam</td>
</tr>
<tr>
<td>Restoril</td>
<td>Temazepam</td>
<td><strong>Temazepam, Oxazepam</strong></td>
</tr>
<tr>
<td>Rohypnol</td>
<td>Flunitrazepam</td>
<td>Flunitrazepam, Desalkylflunitrazepam, 7-Aminoflunitrazepam</td>
</tr>
<tr>
<td>Serax</td>
<td>Oxazepam</td>
<td>Oxazepam</td>
</tr>
<tr>
<td>Valium</td>
<td>Diazepam</td>
<td><strong>Diazepam, Nordiazepam, Temazepam, Oxazepam</strong></td>
</tr>
<tr>
<td>Xanax</td>
<td>Alprazolam</td>
<td>Alprazolam, <strong>Hydroxyalprazolam</strong></td>
</tr>
</tbody>
</table>
## BENZODIAZEPINES

<table>
<thead>
<tr>
<th>Prescription</th>
<th>Benzodiazepine</th>
<th>Parent Drug/Metabolite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ativan</td>
<td>Lorazepam</td>
<td>Lorazepam</td>
</tr>
<tr>
<td>Centrax</td>
<td>Prazepam</td>
<td>Prazepam</td>
</tr>
<tr>
<td>Dalmane</td>
<td>Flurazepam</td>
<td>Flurazepam, Hydroxyethylflurazepam</td>
</tr>
<tr>
<td>Halcion</td>
<td>Triazolam</td>
<td>Triazolam</td>
</tr>
<tr>
<td>Klonopin</td>
<td>Clonazepam</td>
<td>Clonazepam, 7-Aminoclonazepam</td>
</tr>
<tr>
<td>Librium</td>
<td>Chlordiazepoxide</td>
<td>Chlordiazepoxide, Nordiazepam, Oxazepam</td>
</tr>
</tbody>
</table>
THC
THC DETECTION PERIOD

THC metabolites are fat-soluble, and may be retained in fatty tissue depending upon dosage and recent usage history

- May take time to produce consistent negative urine samples
  - Casual users: 2-5 days
  - Chronic users: 3-6 weeks
DETERMINING NEW USE

- THC:Creatinine (THC:CRE) ratios are commonly used to normalize sample dilution effects.

- The ratios can be used directly to monitor THC abstention and elimination, or to determine the probability of a new usage event.

- Most effective when interpreting GCMS analyses
THC:CREATININE RATIO

Ratio is calculated as:

\[ \frac{\text{THC (ng/mL)}}{\text{Creatinine (mg/dL)}} \times 100 = \text{THC:Cre (mg/mg)} \]
THC ELIMINATION

THC Half-Life

Urinary THC excretion half-life is 1-10 days depending on usage history (mean half-life is $3.0 \pm 2.3$ days)$^\dagger$

1 day for infrequent/casual users
10 days for heavy/chronic users

THC Elimination - Usage Comparison

- **Chronic User**
- **Casual User**

**THC Concentration (ng/mL)**

- **Chronic**
- **Casual**

**Days Since Abstention**

- **EIA Cutoff**
- **GCMS Cutoff**

TASC
THC Clearance

99% of Population Negative by 6 weeks
- - -
Median: 18 days

D. Kramer; TASC (2009)
DETERMINING A USAGE EVENT

Medical-Legal Method
Manno, et. al. (1984)‡

If THC:Creatinine ratio between samples increases $\geq 50\%$, new usage on or between these dates is suspected

- False Positive/Interpretation Rate: 0.1%
- False Negative/Interpretation Rate: 24%

THC Concentration vs. THC:Creatinine Ratio

Normal Hydration

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>3</th>
<th>7</th>
<th>10</th>
<th>15</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>THC (EIA)</td>
<td>170</td>
<td>128</td>
<td>88</td>
<td>75</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Creatinine</td>
<td>105</td>
<td>128</td>
<td>112</td>
<td>120</td>
<td>120</td>
<td>99</td>
</tr>
<tr>
<td>THC:Cre</td>
<td>162</td>
<td>100</td>
<td>79</td>
<td>63</td>
<td>33</td>
<td>30</td>
</tr>
</tbody>
</table>
THC Concentration vs. THC:Creatinine Ratio

Diluted Example

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>THC (EIA)</th>
<th>Creatinine</th>
<th>THC:Cre</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>150</td>
<td>105</td>
<td>143</td>
</tr>
<tr>
<td>3</td>
<td>132</td>
<td>130</td>
<td>102</td>
</tr>
<tr>
<td>7</td>
<td>95</td>
<td>110</td>
<td>86</td>
</tr>
<tr>
<td>10</td>
<td>42</td>
<td>18</td>
<td>233</td>
</tr>
<tr>
<td>15</td>
<td>40</td>
<td>120</td>
<td>33</td>
</tr>
<tr>
<td>22</td>
<td>30</td>
<td>160</td>
<td>19</td>
</tr>
</tbody>
</table>

New Usage

Diluted

Legend:
- THC (EIA)
- Creatinine
- THC:Cre
THC Concentration vs. THC:Creatinine Ratio

**Dehydrated Example**

<table>
<thead>
<tr>
<th></th>
<th>THC (EIA)</th>
<th>Creatinine</th>
<th>THC:Cre</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>150</td>
<td>105</td>
<td>143</td>
</tr>
<tr>
<td>3</td>
<td>128</td>
<td>130</td>
<td>98</td>
</tr>
<tr>
<td>7</td>
<td>170</td>
<td>190</td>
<td>89</td>
</tr>
<tr>
<td>10</td>
<td>75</td>
<td>120</td>
<td>63</td>
</tr>
<tr>
<td>15</td>
<td>40</td>
<td>120</td>
<td>33</td>
</tr>
<tr>
<td>22</td>
<td>30</td>
<td>99</td>
<td>30</td>
</tr>
</tbody>
</table>
SUMMARY

- Most clients are testing negative by 1-3 weeks
- 99% of clients will test negative by 6 weeks
- THC:CRE ratios should decrease at least 50% every 10 days
- An increase in THC:CRE ratio of 50% suggests new usage
THC CONCENTRATES
PREPARATION

- Made by packing a long tube with marijuana leaves
- Add butane (lighter fluid) to the tube and collect the extract
- Evaporate butane
- Remaining oil is a concentrated THC product
DABBING

- Place a ‘dab’ of concentrate on a heated surface
- Inhale vapors
- Delivers a THC hit of 50-90%

Concerns

- Explosions during production
- “Dirty Oil” containing harmful contaminants
- The possibility of overdosing
SYNTHEtic cannabinoIIDS

Spice/K2
CANNABINOID RECEPTORS

- Synthetic cannabinoids are substances that bind to one of the known cannabinoid receptors, i.e. CB1 or CB2, present in human cells.
- The CB1 receptor is located mainly in the brain and spinal cord and is responsible for the typical physiological and particularly the psychotropic effects of cannabis.
- The CB2 receptor is located mainly in the spleen and cells of the immune system.
SPICE

- Assassin Revolution, Bizarro Blueberry,
  - Black Magic Smoke, Cloud 10,
  - Colorado, Darkness, Kite,
  - Purple Diesel, Sunshine
  - Daydream, Sunshine Nightmare,
  - Hammerhead, Diablo

- Sold in smoke shops and online

- Labeled and sold as incense: “Not for Human Consumption”

- Herbs and botanicals treated with synthetic cannabinoids
SYNTHETIC CANNABINOIDs

- First Generation Spice: 2009
  JWH-018, JWH-073, JWH-250

- Federal Ban: March 2011
  JWH-018, JWH-073, JWH-200, CP-47,497, CP-47,497-C8 homologue

- Second Generation Spice:
  AM-2201, AM-2233, JWH-019, JWH-122, JWH-203, JWH-210, MPPP, RCS-8 (JWH-018, JWH-073, JWH-250 found in some products)
1\textsuperscript{ST} \& 2\textsuperscript{ND} GENERATION SPICE

$\Delta^9$-THC

(1) JWH-018

(2) JWH-073

(3) AM-2201

(4) JWH-019

(5) JWH-122

(6) JWH-210

(7) JWH-250
THIRD GENERATION SPICE

(1) MAM-2201
(2) A796,260
(3) UR-144
(4) XLR-11
(5) URB597
FOURTH GENERATION SPICE

PB-22

5F-PB-22

AB-FUBINACA

AB-PINACA

AB-CHMINACA
DETECTION

- Most compounds are **not** detected by standard drug screening tests (Negative on standard THC screen)

- Detection period estimated to be 24-72 hours in urine
  - Primarily detect metabolites in urine

- Shorter detection period in blood and oral fluid
  - Parent drug detected

- Testing methodology utilized
  - ELISA
  - Liquid Chromatography/Tandem Mass Spectrometry (LC-MS/MS)
  - Expensive
TESTING CHALLENGES

- Hundreds of potential compounds can be used in the manufacturing process of Spice products
- Moving target – Spice industry responds to legislation, laboratories must respond to latest trend
- Lack of complete understanding of metabolism for all known synthetic cannabinoids
- Development of affordable screening tests that react with a wider range of synthetic cannabinoids
SYNTHETIC STIMULANTS

Bath Salts
BATH SALTS

- Stimulant like Amphetamines

- Substituted cathinones -- Methylenedioxy.pyrovalerone (MDPV) mephedrone, and methylone are the chemicals most often found in “bath salts”

- Cathinone is a chemical derived from the Khat plant

- Consumed orally or nasal administration
WHERE/HOW IS IT SOLD?

- Sold in head shops, convenient stores and online
- Packaging
  - Bath Salts
  - Plant Food – White Snow
  - Insect Repellent – White Lightning
  - Stain Remover – Thunda Cat
- “NOT FOR HUMAN CONSUMPTION”
EFFECTS

- Severe side effects
  - Suicidal thoughts
  - Agitation
  - Combative/Violent behavior
  - Confusion
  - Hallucinations/psychosis
  - Increased heart rate
  - Hypertension
  - Chest Pain
  - Death or serious injury

- The speed of onset is 15 minutes, while the length of the high from these drugs is four to six hours.
INCREASING PROBLEM

- TODAY  |  January 04, 2013

Navy’s anti-drug ad aims to scare sailors

Navy officials say a new ad aimed at a designer drug called bath salts was produced after an alarming spike in its use by sailors in 2012, but some are calling the video over the top. NBC’s Jim Miklaszewski reports.

- http://www.today.com/video/today/50362252
OVER-THE-COUNTER CONCERNS

DXM
DEXTROMETHORPHAN

- OTC
- Cough Suppressant
- Found in more than 120 OTC cold medications
- Referred to as “Robo-tripping” or “Skittling”
- Medications can also contain pseudoephedrine, acetaminophen and chlorpheniramine
- Abuse occurs in all age groups but is more prevalent in youth
DXM EFFECTS

- Heightened sense of perceptual awareness
- Altered time perception
- Visual hallucinations

- Hyperexcitability
- Lethargy
- Ataxia
- Slurred Speech
- Sweating
- Hypertension
- Nystagmus

Reported by abusers

Clinical Presentation
DXM EFFECTS

- At high doses the pharmacology of DXM is similar to PCP and Ketamine
- Impaired motor function
- Numbness
- Nausea/Vomiting
- Increased heart rate and blood pressure
THANK YOU FOR YOUR TIME.

Is this cup half full or half empty?

Are you going to give me that urine sample or not?