The Misuse of Prescription and Over the Counter Drugs: What is the Problem and What Can We Do?

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Accreditation:
Pharmacists: 0798-0000-11-005-L05-P
Pharmacy Technicians: 0798-0000-11-005-L05-T
Nurses: N-444

CE Credits: 1.0 contact hour
Target Audience: Pharmacists, Technicians & Nurses

Program Overview:
Anytime you take more of a drug than is recommended on the label, you are abusing that drug. People think if 2 pills don’t work for them, they can take 3. But the labels on these medications clearly state all ingredients; there is more going into the body than just the extra milligrams of the drug. And because of the long process drugs take to metabolize, people actually overdose accidentally on both OTC and prescription medications. Unfortunately, the drug may do irreparable damage to the body before any important symptoms develop. Most surviving victims of drug overdose are fortunate and have no long term effects; but some who are not so fortunate suffer from kidney, liver, or heart failure, and even death.

Objectives:
• Outline the actions that lead to misuse of OTC and prescription drugs.
• Identify the signs and symptoms that can occur following accidental overdoses of either common OTCs or prescription drugs including acetaminophen, dextromethorphan, opioids, and stimulants.
• Describe how pharmacists can interact with patients to minimize the misuse and abuse of OTC and prescription drugs.

Speaker: Dr. Lisa Booze is the Clinical Coordinator and a Certified Specialist in Poison Information at the Maryland Poison Center, a division of the University Of Maryland School Of Pharmacy. She is responsible for developing and implementing toxicology continuing education programs for health professionals in Maryland. She is a co-ordinator of the Poison Center Surveillance for Chemical and Bioterrorism and Public Health Program, supported by the Maryland Department of Health and Mental Hygiene. Dr. Booze is a member of the American Association of Poison Control Centers, the American Academy of Clinical Toxicology, and the Expert Consensus Panel that develops Out-of-Hospital Management Guidelines for U.S. poison centers.

Speaker Disclosure: Dr. Booze has no actual or potential conflicts of interest in relation to this program.

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### Why Do People Misuse Drugs?

- Do not follow directions
- Do not read ingredients...take multiple products with the same ingredient
- Take drugs not prescribed for them
- OTC's are perceived safe even in large doses
- Dependence
- Abuse
  - More socially acceptable
  - Perceived to be safer
  - Easier to obtain

### A Pharmcoepidemic

- Misuse/abuse of Rx and OTC's is equal to or greater than the abuse of illegal drugs
  - 15% of 12th graders have used Rx drugs nonmedically in past year (*Monitoring the Future 2010*)
  - 41% of teens believe they are safer than illegal drugs; 61% say they are easier to get (*Partnership for a Drug Free America 2008*)
  - 2005-2008: rate of prescription drug abuse by military tripled (11%)

### Complications from Rx and OTC Drug Misuse and Abuse

- Physical dependence
- Tolerance
- Inappropriate medical treatment
- Adverse effects
- Drug interactions
- Unintentional overdoses

### ER Visits Due to the Nonmedical Use of Pharmaceuticals (2004-2008)

- Illicit Drugs
  - ER visits increased by 83%
- Pharmaceuticals
  - >971,000 ED visits in 2008 (estimated)

Drug Abuse Warning Network
Unintentional drug overdose deaths by major type of drug, 1999-2007 (CDC)

Unintentional Opioid OD Deaths vs Opioid Sales
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**Rx Opioid Abuse**

- 16 year old male is found unconscious by his parents on his bedroom floor. Friend witnessed him crushing and snorting a tablet a few hours before.
- Unresponsive to pain, RR 6, P 76, BP 100/56, pulse ox 90%, lungs clear, skin cool, pale and dry, pupils 2 mm & minimally responsive, ECG: NSR
- EMS gave 0.4 mg naloxone x 2; respirations increased to 12, responded to pain and verbal stimuli.
- Upon awakening, he admitted to buying Oxycontin® from a neighbor who takes it for cancer pain. He crushed and snorted 1 tablet.

**Rx Opioid Analgesics**

- Hydrocodone
- Oxycodone
- Fentanyl
- Methadone
- Hydromorphone
- Oxymorphone
- Buprenorphine
- Tramadol
- Tapendatol

**Pain Relievers Used by Ages 12 and Older Who Reported Lifetime Nonmedical Use of Pain Relievers, 2009**

<table>
<thead>
<tr>
<th>Pain Reliever</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocodone</td>
<td>67%</td>
</tr>
<tr>
<td>Codeine/Propoxyphene</td>
<td>60%</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>44%</td>
</tr>
<tr>
<td>Morphine</td>
<td>8%</td>
</tr>
<tr>
<td>Other opioids</td>
<td>21%</td>
</tr>
</tbody>
</table>
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**ED Visits: Narcotic Analgesics, 2004 & 2008**

**How Do People Get Rx Pain Relievers?**

<table>
<thead>
<tr>
<th>Method</th>
<th>2004</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bought on internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bought from dealer/stranger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bought/stole from friend/relative</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Prescription from 1 doctor</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Free from friend/relative</td>
<td>60</td>
<td>50</td>
</tr>
</tbody>
</table>

2008 National Survey on Drug Use and Health

**Hydrocodone, Oxycodone**

- **Hydrocodone**
  - 1 in 10 high school seniors reported last year nonmedical use of hydrocodone *(MTF 2009)*
  - In combination with acetaminophen (Vicodin, Lortab) or ibuprofen (Vicoprofen)
  - Schedule III or IV

- **Oxycodone**
  - 10-fold increase in ER visits, 1996-2004 *(Drug Abuse Warning Network)*
  - 152% increase between 2004-2008

**Methadone, Oxymorphone, Tramadol**

- **Methadone**
  - 1999-2006 (CDC): deaths increased 7-fold
  - Long duration; QT prolongation

- **Oxymorphone (Opana®)**
  - More potent than morphine; more euphoria

- **Tramadol (Ultram®)**
  - Initially thought to be non-addictive
  - Also inhibits the reuptake of serotonin and norepinephrine (serotonin syndrome, seizures)
**Buprenorphine**

- *Subutex* SL tablets; *Suboxone* (with naloxone)
- High affinity for opioid receptor
- Opioid-like effects (euphoria, sedation) but less sedation, respiratory depression and effect on motor skills – ceiling effect
- Used by those who are addicted to low doses of opioids or those in the early stages of withdrawal

**Fentanyl**

- 50 times more potent than heroin
- Patch (*Duragesic*®…)
  - Chew patches, inject contents, boil
- Lozenge/oral transmucosal (*Actiq*®)
  - Buccal tablet (*Fentora*®)
  - Buccal film (*Onsolis*®)
  - Injection (*Sublimaze*®)

**Opioid Toxidrome**

- Lethargy, coma
- Respiratory depression
- Constricted pupils
- Other clinical effects:
  - Pulmonary edema
  - Hypotension, bradycardia, hypothermia
- Treatment: Naloxone
  - 0.4–2.0 mg IV, IM, intranasal
  - Continuous infusion for long-acting opioids

**Deterrents to Rx Opioid Abuse**

- **Talwin® Nx**
  - Pentazocine + naloxone
- **Embeda™**
  - Long-acting morphine + core of naltrexone
- **Remoxy™**
  - Long-acting oxycodone + deterrent to crushing & dissolving
- **Acurox®**
  - Oxycodone + niacin + deterrent to crushing and dissolving
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Question #1

More than 55% of teens and adults who use Rx pain relievers nonmedically obtain them by what means?

- a. Buy over the internet
- b. Have a prescription from a doctor
- c. Get them free from a friend or relative
- d. Buy them off the street

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Benzodiazepines

- Xanax (Zany Bars), Lorazepam, Diazepam, Clonazepam
- 21.5 million have used benzodiazepines for nonmedical uses (SAMHSA)
- 80% of benzo abuse is polydrug abuse
- 73% of heroin users also use benzodiazepines (NIDA)
- Used to boost the effect of methadone
- Inhibits metabolism of methadone by utilizing the same CYP450 methadone toxicity

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Methadone + Xanax

- 28 yo unresponsive but breathing after taking methadone (75 mg?) + Xanax (4 mg?)
- EMS: in full arrest
- Initial pH=6.84, pCO₂ 128, O₂ sat 58%, lactate 17.2, hypotensive
- Died despite naloxone, vasopressors and resuscitation
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**Benzodiazepines - Treatment**

Flumazenil (Romazicon®)

Not recommended if
- intentional OD
- benzo-dependent
- mixed ingestions

**Seroquel® (Quetiapine)**

"Baby heroin", "quell", "Susie Q"

Commonly abused in prisons

Snorted; IV

Dependence?

Toxic effects: lethargy, tachycardia, constricted pupils, QT prolongation (uncommon)

**Acetaminophen**

- U.S. consumers purchased more than 28 billion doses of products containing acetaminophen (FDA)

- 56,000 ER visits,
- 26,000 hospitalizations,
- 458 deaths related to acetaminophen overdoses per year

   *Nourjah. Pharmacoepidemiol Drug Safety 2006;25:6*

**Acetaminophen Liver Failure Cases On The Rise**

662 acute liver failure patients at 22 centers from 1998-2003

- 42% due to acetaminophen
- 1998: 28% due to APAP
- 2003: 51% due to APAP

- 48% of APAP cases were unintentional OD's!

- 63% → APAP/narcotic combinations
- 38% took ≥ 2 APAP products

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**FDA Advisory Committee Recommendations - June 2009**

- Single dose: 650 mg max
- 500 mg tablets: Rx only
- Decrease max daily dose from 4000 mg
- Rx combination products eliminated or black box warning
- One OTC liquid concentration
- Avoid “APAP” on labels

**January 13, 2011: FDA limits Rx products to 325mg**

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**Acetaminophen**

- **Acute toxic dose**
  - children ≥200 mg/kg
  - adults ≥7.5 - 10g
- **Toxicity with chronic use**
  - ≥4·10 g/day in adults
  - ≥150-200 mg/kg/day in children
- Hepatotoxicity from the formation of a metabolite that is normally detoxified by glutathione

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**Clinical Presentation**

Only mild GI symptoms initially

- RUQ pain
- Jaundice
- Elevated AST & ALT, increased INR
- Encephalopathy
- Metabolic acidosis
- Renal failure
- Hepatic failure & death

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**Acetylcysteine**

- **EARLY**
  - glutathione precursor
  - glutathione substitute
- **LATE**
  - improves microcirculatory blood flow
  - scavenges oxygen free radicals
  - Oral or IV administration
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**Question #2**

In 2009, an FDA advisory committee recommended that the maximum daily dose of acetaminophen should be lowered to less than _____

- a. 1 gram
- b. 4 grams
- c. 8 grams
- d. 10 grams

**Prescription Stimulants**

- Methylphenidate, Amphetamines, Lisdexamfetamine (Vyvanse®)
- 91% increase in ED visits due to nonmedical use of stimulants (2004-2008, DAWN)
- Sympathomimetics
  - Central nervous system stimulation
  - Stimulate release of and/or block the reuptake of norepinephrine, serotonin, dopamine
  - Stimulate alpha and beta adrenergic receptors

**Adderall – The Drug of Choice**

- Full-time college students twice as likely to use Adderall nonmedically as those not in college or part-time students (18-22 yo’s, NSDUH 2009)
- More likely to be polydrug abusers
  - 3 times more likely to have used marijuana
  - 5 times more likely to have used Rx analgesics
  - 8 times more likely to have used Rx sedatives
  - 8 times more likely to have used cocaine

- 6-8% college students use stimulants not prescribed for them
- 75% favor Adderall
- Perceived to be easy to obtain, more effective, safe, & last longer compared to caffeine

(Addiction 2005;100:96-105; Pharmacotherapy 2006; 26:1501; DEWS Investigates, CESAR, Univ of MD, October 2006)
**Stimulant Toxidrome**

<table>
<thead>
<tr>
<th>CNS</th>
<th>CV</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Agitation</td>
<td>• Tachycardia</td>
<td>• Hyperthermia</td>
</tr>
<tr>
<td>• Paranoia</td>
<td>• Hypertension</td>
<td>• Warm skin, diaphoresis</td>
</tr>
<tr>
<td>• Hallucinations</td>
<td>• Chest pain, MI</td>
<td>• Dilated pupils</td>
</tr>
<tr>
<td>• Tremors</td>
<td>• Hemorrhagic stroke</td>
<td></td>
</tr>
<tr>
<td>• Seizures</td>
<td>• CV collapse</td>
<td></td>
</tr>
</tbody>
</table>

**Treatment – Stimulant Overdoses**

- Benzodiazepines
- Hydration
- Physical cooling
- Vasopressors, antiarrhythmics
- Use Haldol with caution!

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**Triple C**

- 16 year old girl found sleeping outside of her home. She was confused and hallucinating. She admitted to ingesting 20 Coricidin HBP Cough & Cold tablets 3 hours ago.
- HR 150, BP 170/100, RR 18, 5 mm reactive pupils with horizontal nystagmus.
- 50 grams activated charcoal, IV fluids
- Discharged 72 hours later

**Dextromethorphan**

- 14-16 year olds
- *DXM, robo, CCC, velvet, rojo, triple C*
- 72.4% increase in ER visits, 2004-2008
- Abused dose = >200-400 mg
- Rapid tolerance – doses as high as 1200-1500 mg
Dextromethorphan

Effects
- Hallucinations, euphoria
- Hypertension, tachycardia, agitation, ataxia

Treatment
- Benzodiazepines
- Naloxone??

FDA Advisory Panel
- Voted against making it a controlled substance
- Sept 14, 2010

What Can We Do...?

Provide clear advice on how to take medications...
- Do not take multiple products with the same ingredient
- Do not take more than is prescribed; always read labels
- OTC’s are generally not meant to be taken chronically

What Can We Do...?

- Prescription Take-Back Days
  - 121 tons collected at DEA event, Sept 25, 2010

- Prescription Drug Monitoring Programs
  - National Family Partnership: www.lockyourmeds.org

- Counsel patients on how to safeguard their medicines at home
- Educate patients on how to dispose of their meds
- Watch for escalating use of OTC or Rx drugs
- Look for fake or altered prescriptions, prescriptions from multiple doctors, in sales of cough and cold meds
- Be wary of reports of missing drugs
- Control access to some OTC’s
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