

## Drug Overdoses



### Recognition and Treatments

## Objectives:

- Define Overdose
- Review Statistics of the most common medications and street drugs used to Overdose
- Review the pharmacology and treatments of several prescribed meds and street drugs
- Review the use of Poison Control and the information that can be gained by using them.

## What is an overdose??

- The term **drug overdose** (or simply **overdose** or **OD**) describes the ingestion or application of a drug or other substance in quantities that are excessive. An overdose is widely considered harmful and dangerous as it can result in death.
- The amount considered to be an overdose is based on multiple factors.

## Factors affecting Overdoses

- Patient's age – The older vs Younger
- Patient's weight
- State of Patient's liver – Hx of Alcohol use or Dysfunction
- State of Patient's Kidneys – Hx of Renal Insufficiency or failure
- The amount of the drug taken
- Combining meds with alcohol or other drugs
- Any Co-morbidities - Obesity, Diabetes

## ODs that Effect the Kidneys

- **Aspirin** – metabolic acidosis with Kidneys as a buffer
- **Amoxicillin**
- **NSAIDs** – MODs
- **Methamphetamine** – Rhabdomyolysis which floods the kidney with protein and shit them down
- **Gentomycin and Vancomycin**

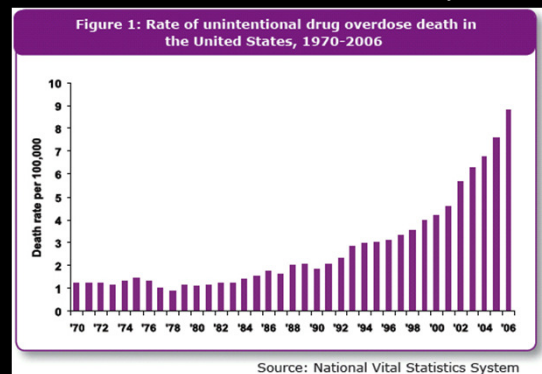
## ODs that Affect the Liver

- **NSAIDs** – Too much creates a toxic metabolite and depletes the protecting antioxidants.
- **Niacin** – Taken by drug users thinking they can flush the drugs from their systems
- **Ambien**
- **Fluconazole**

## What are the Most OD'd Items??

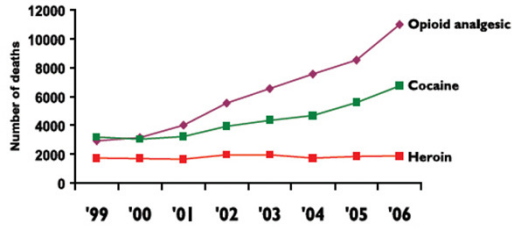
- **#1 – Opiate Pain Meds – Methadone, Fentanyl, Oxycodone, Oxycotin**
- **#2 – Cocaine / Methamphetamine**
- **#3 – Heroin**
- **#4 – Anti-Depressants (SSRIs and TCAs) – Amytrityline, Elavil, Paxil, Lexapro**

## Rates of Overdose have Steadily Risen



## Opiates Vs Cocaine Vs Heroin

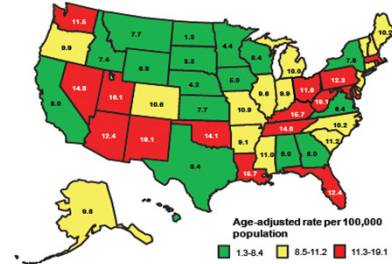
Figure 2: Unintentional drug overdose deaths by major type of drug, United States, 1999-2006



Source: National Vital Statistics System

## Overdose Death Rates Per State

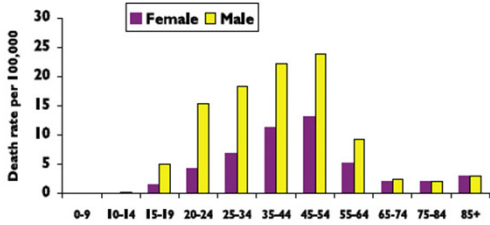
Figure 3: Drug Overdose Death Rates by State, 2006



Source: National Vital Statistics System

## Overdoses by Sex and Age

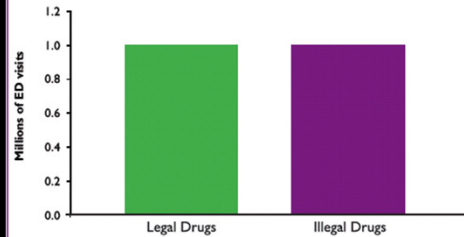
Figure 4: Drug overdose mortality rates by sex and age group, United States, 2006



Source: National Vital Statistics System

## ED Visits – Illegal vs. Legal Meds

Figure 5: Estimated numbers of ED visits involving legal drugs used nonmedically and illegal drugs, United States, 2008



Source: Drug Abuse Warning Network

## North Carolina Drug Facts

- **2008 Federal Drug Seizures**
  - Cocaine:** 384.3 kgs. (\$8,454,600.00)
  - Heroin:** 14.6 kgs. (\$10,000,000.00)
  - Methamphetamine:** 19.2 kgs.
  - Marijuana:** 1,805.7 kgs.
  - Hashish:** 5.1 kgs.
  - MDMA:** 0.0 kgs./566,380 du (\$3,398,280.00)
  - Meth Lab Incidents:** 196 (DEA, state, and local)

## Opium Based Pain Meds

- Morphine
- Fentanyl
- Methadone
- Oxycotin
- Percocet
- Demerol
- Vicodin



## Heroin

- Invented in 1874
- The Bayer Company first marketed it as a cough syrup in 1895
- Replaced OTC Morphine as a “non-addictive” cough syrup
- Is listed as Schedule I in NC Drug Enforcement Law (NCGS Chapter 90)
- Smoked and Injected
- Making a Big Comeback !!!!!

## Early Heroin Advertisement and Bottle



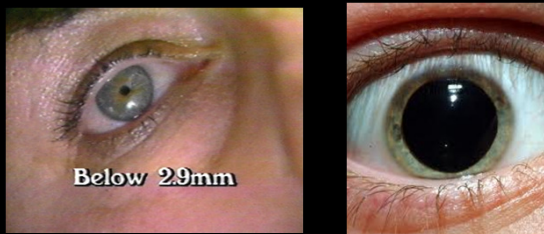
### Heroin Pictures



### Signs and Symptoms of Opiates

- Altered Mental Status / Lethargy
- Pinpoint Pupils
- Needle Marks – arms, neck, between toes
- Respiratory Depression / Apnea / Hypercapnia
- Bradycardia
- Non-Cardiac Pulmonary Edema due to dilated capillaries that leak into interstitial spaces

### Pinpoint vs Dilated Pupils



### Needlemarks



## Treatments for Opiate Overdoses

- Good assessment using SAMPLE
- Oxygen, assist Ventilations as required – Control the airway early
- Naloxone (Narcan) per protocol – Nasal, IM, IV
- Charcoal within 45 minutes of ingestion if it is PO
- Watch for improvement of Respiratory Drive
- Vomiting and Combative patients follow shortly after Narcan administered.

## Dextromethorphan

- Dextromethorphan is a semi-synthetic opiate derivative which is legally available over-the-counter in the United States
- Onset – 20 mins to 1 hour, lasts 1.5 to 3 hrs
- Can Last over 6 hrs in heavier doses
- *High doses cause effects often compared to Ketamine and PCP*

## “Robo Tripin”

- Risk of Death 2,500 - 20,000 mg
- Low Doses – 100 to 200 mg – Euphoria
- Medium Doses – 2.5mg/kg to 7.5mg/kg have euphoria, vivid imaginations, and hallucinations
- High Doses – over 7.5mg/kg – out of body experiences, profound AMS, psychosis
- Suggested Antidote- Narcan, 1 study only

## Cocaine

- Produced from the Coca Plant in South America
- Sympathomimetic
- Routes of Ingestion -Smoked, Injected, Snorted
- Can be as cheap as \$5.00 per rock in base form known as “Crack Cocaine”
- One Kilo (2.2 pounds) \$22,000.00
- Highly addictive, usually after one use

## Cocaine Pics



## Signs of Cocaine (Stimulant) Overdose

- Dilated Pupils
- Flushed appearance
- Tachycardia
- Tachypnea
- Profuse Sweating
- Altered Mental Status

## Treatment of Stimulant Overdose

- Basic assessment essentials, SAMPLE
- Airway, Oxygen
- 12 Lead EKG to R/O Underlying MI or Ischemic Changes aka Prinz-Metal Angina
- Ivs
- Benzo of choice – Versed, Ativan, Valium, per protocol
- Treat Chest Pain as if MI – NTG, ASA, etc

## *TCAs – Wide is Deadly!!!*

- Tricyclic Antidepressants
- Named for the three rings in their chemical makeup
- Have gone out of favor for more user friendly SSRIs.
- Used to treat mood disorders, Bipolar Disorder, OCD, Panic disorders, and Borderline personality disorder

## TCAs – Multi-threat Meds

- Dangerous because of their ability to block both sodium and calcium channels
- They can also act as potent Anticholinergics and antihistamines
- Taken with example cimetidine, methylphenidate, fluoxetine, antipsychotics, and calcium channel blockers increase the delay in absorption therefore increasing cardiotoxicity of TCAs

## TCAs – Signs and Symptoms

- AMS – Agitation, confusion, lethargy
- Resting tachycardias
- Dry Mouth
- Blurred Vision
- Fever
- Hypotension, ventricular dysrhythmias
- Prolonged QRS, QT, and PR intervals

## Serotonin Reuptake Inhibitors (SSRIs)

- SSRIs work by blocking a receptor in the brain that absorbs the chemical serotonin
- This makes more Serotonin available for use as neurotransmitter
- Depression can double during initial stages of treatment
- **SSRIs can cause dangerously high blood pressure when taken with monoamine oxidase (MAO) inhibitors (Nardil) or Demerol**

## Serotonin Syndrome

Type of Meds	Medication Name
Antidepressants	TCAs, SSRIs, Trazadone
Opioids	<a href="#">tramadol</a> , <a href="#">oxycodone</a> ,
CNS Stimulants	<a href="#">methylphenidate</a> , <a href="#">methamphetamine</a> , <a href="#">cocaine</a>
Psychedelics	MDMA, LSD, MDA
Herbs	Panax Ginseng, St. John's Wart
Others	Valporate, lithium, <a href="#">ondansetron</a> ,

## Signs and Symptoms of Serotonin Syndrome

- Clonus with or without AMS
- Tachycardia
- Shivering
- Body Temp 102' or more
- Hypertension
- Hyperreflexia
- Hypervigilance / Agitation
- Metabolic Acidosis
- Seizures
- Rhabdomyolysis
- Renal Failure
- DIC

## TCA Treatments

- Mainly Supportive
- Oxygen
- Cardiac monitoring and serial 12 Lead EKGs
- Sodium Bicarbonate 1meq / kg, then 100 meq in 100ml 0.9% NS over 30 minutes
- NaBicarb works by maintaining the protein binding with the cell, therefore decreasing bio-availability

## Spice / JWH-018

- Synthetic Cannabis / THC
- Not currently scheduled by DEA in the United States
- Some states have outlawed it – Arkansas, Kansas, Kentucky
- 5 plus Times more potent than regular Cannabis, THC receptors show more affinity
- Side effects Anxiety, seizures, and agitation

## Spice - Continued

- Very Popular in professional athletes and young adults – Not illegal in most states – NO POSITIVE DRUG TESTS!!!!
- Very affordable
- Found in convenience stores and tattoo shops
- Also found in places where drug paraphernalia is sold
- One person's statement "Like LSD, its only good to get high"

## Spice Treatments

- Oxygen
- 12 Lead EKG
- Control Heart Rates with Benzos

## Spice Pictures



## Khat

- Flowering plant native to tropical East Africa and Arabian Peninsula
- Contains Cathinone – an amphetamine like substance that causes excitement, loss of appetite, and euphoria
- Breaks down to produce cathine and norephedrine.
- Said to produce effects like cocaine
- Leaves have to be refrigerated and moistened during transport to remain potent.

## Khat – Signs and Symptoms

- increased heart rate, breathing rate, body temperature, blood pressure
- increased alertness, excitement and energy
- decreased appetite.
- increases in severity of psychological problems (such as depression, anxiety, irritation and more severe psychological problems)
- difficulty sleeping
- impotence
- gastrointestinal tract problems, such as constipation
- inflammation of the mouth and other parts of the oral cavity
- oral cancer

## Khat



## MDMA (Ecstasy)

- Often associated with “Raves” and Electronic Dance Music Parties
- People are found with pacifiers due to nashing of teeth
- Also found with a lot of Bottled water or liquids due to the hyperthermic effects
- Thought to produce “loving Feelings” within the group
- \$6.00 per tablet, lasts

## Signs and Symptoms of MDMA

- Confusion
- Anxiety, Paranoia
- Hypervigilance
- Hallucinations
- Retro and Antegrade Amnesia
- Myoclonus
- Tachypnea
- Palpitations
- Chest Pain
- Cardiac Dysrhythmias
- Cardiogenic shock
- Severe Hyperthermia
- Syncope
- Coma

## Ecstasy



### More Ecstasy Pics



### GHB – The Date Rape Drug

- AKA Ruffies
- Works much like MDMA
- Provides a “Heightened experience” at parties and social events
- Known for Respiratory Depression, AMS, and Amnesia
- Persons do not remember the incident until well after it happened.

### Signs and Symptoms of GHB

- Dizziness
- Agitation
- Nausea
- Drowsiness
- Visual Disturbances
- Depressed Respiratory Drive

### Treatment for MDMA / GHB

- Assessment with SAMPLE
- Airway Control and Oxygenation
- IV
- Heart Monitoring / 12 Lead EKG
- Assess Body Temperature
- Apply Cold Packs as Required



## NSAIDs – The Silent Epidemic

- 51 percent of responding patients read the label when using an OTC for the first time.
- Only 34 percent read the label for the active ingredients.
- Only 19 percent read the label for usage instructions.
- Only 10 percent read the label for possible adverse effects or usage warnings

## NSAIDs – More Issues

- 69 percent took more than the recommended dose at one time.
- 63 percent took the next dose sooner than directed on the label.
- 44 percent took more per day of the medication than the label directed.
- 34 percent could identify the active ingredient that was consumed leading to duplication of meds taken

## NSAIDs

- Tylenol – 150 mg / Kg or 7,000 mg in one dose is toxic.
- Peds Tylenol maximum oral dose is no more than 90 mg/kg
- Naproxen – 1,500 mg, Half Life 12-17 hrs
- Peds Naproxen – 400 mg/kg

## NSAID OD Signs and Symptoms

- Abdominal Pain
- Nausea
- Vomiting
- Elevated Liver Enzymes
- Bradypnea or tachypnea
- May antagonize beta-blockers, diuretics, and ACE Inhibitors causing even higher blood pressure
- Ringing in the ears or transient hearing loss
- Myoclonus (muscle twitching)

## Bath Salts

- Off white powdery substance
- Street names of Vanilla Sky, Bonsai, and Ivory Wave
- Chemical name is methylenedioxyprovalerone
- MDPV for short
- Mimics the high of Meth and Cocaine
- Sold via the internet
- High addiction rate

## Bath Salts Continued

- Connected with self mutilation and suicide
- Signs symptoms are tachycardia, AMS, agitation, diaphoresis, hyperthermia, and hypertension
- Treatment includes IV Benzos (Versed and ativan tend to work best), fluids and aggressive ventilatory management for cardiovascular collapse

## Bath Salts (Continued)

- Patients may also present in Rhabdomyolysis including renal failure, hyperthermia, tea colored urine, muscle pain, confusion and GI symptoms.
- Treatment requires aggressive fluid boluses and possibly sodium bicarb up to emergency dialysis.
- Most states are trying to criminalize the production and possession of Bath Salts

## Bath Salts



## What's wrong with this guy??



## Poison Control

- **1-800-222-1222**
- Will put you in contact with the nearest poison control center in your area
- Will give you guidance about proper care in the event an overdose took place.
- Designed to reduce costly emergency room visits
- 63% of all poison control calls are handled at home without ED visits
- Provide data and follow up on Poisonings / ODs

## Bibliography / Sources

- [www.erowid.org](http://www.erowid.org) – database of true drug experiences, chemistry, health concerns, and treatment options
- [www.aapcc.org](http://www.aapcc.org) – American Association of Poison Control Centers
- [www.justice.gov/DEA](http://www.justice.gov/DEA) - United States Drug Enforcement Administration
- [www.emedicine.com](http://www.emedicine.com)
- [www.JEMS.com](http://www.JEMS.com)