



Kids and Drugs...



what are they using and
abusing??



Statistically Speaking...

- A 2009 survey of 46,348 students in 8th, 10th and 12th grade revealed:
 - 46.7% of 12th graders report having used illicit drugs in their lifetime.
 - Marijuana use across the three grades have remained steady for the past 5 years.
 - 11.8% 8th graders, 26.7% 10th graders, 32.8% 12th graders
 - Non-medical use of OxyContin and Vicodin has increased over the past 5 years with nearly 1 in 10 high school students reporting abuse.



How are they getting this stuff ?

- 4.5% bought from a dealer or stranger
- 10% bought from a friend or relative
- 10% took from a friend or relative
- **47.3%** got it for FREE from friends!

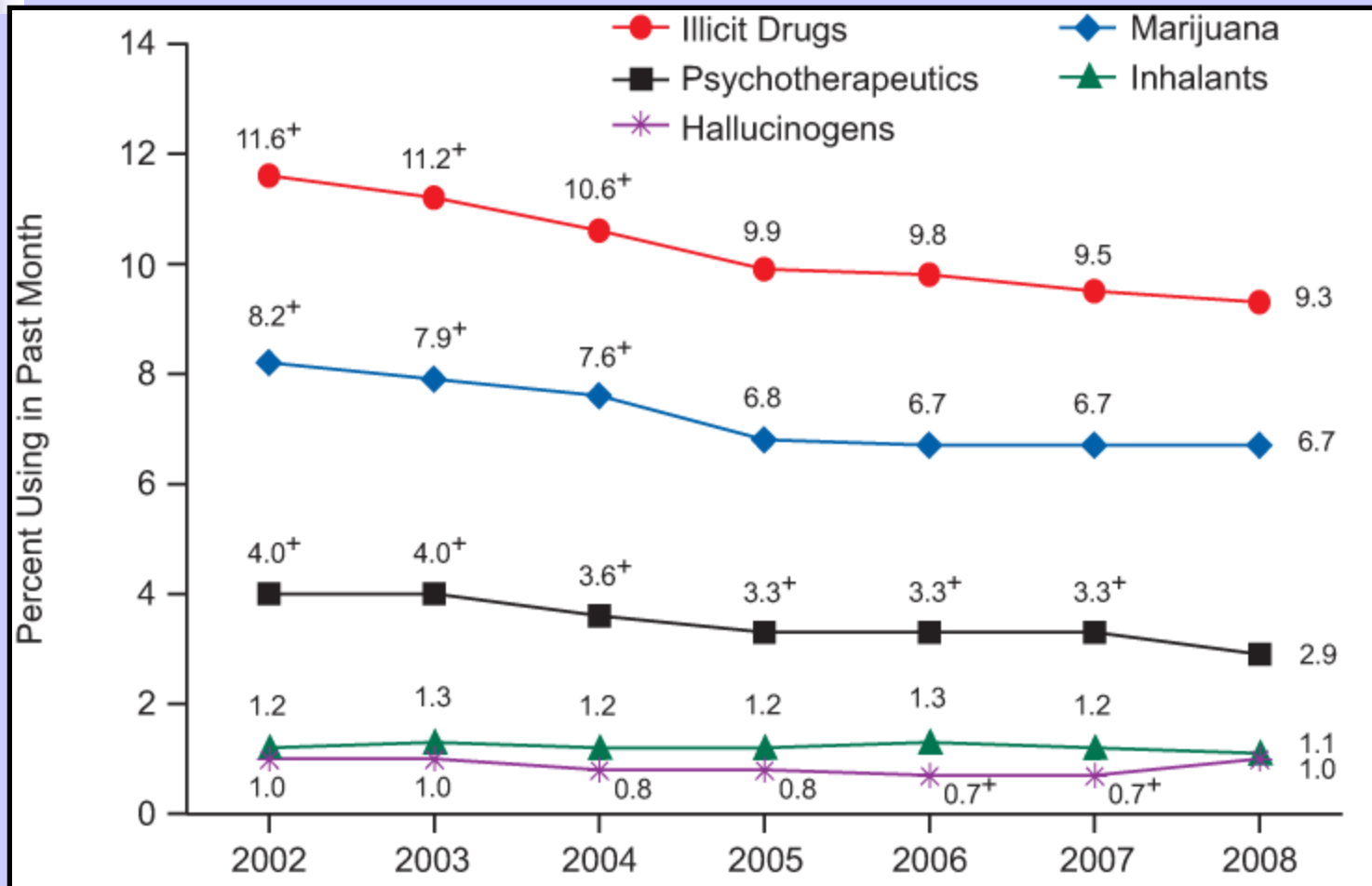
*data obtained from a 2006 survey of 12-17 year olds.



Who is using...

- Adolescent males and females have similar rates of substance use.
 - However, substance dependence/abuse is higher in males.
- Age: % using in past month:
 - 12-13 years 3.3%
 - 14-15 years 8.6%
 - 16-17 years 15.2%
 - 18-20 years 21.5%
- Race: Persons 12 or older:
 - Highest: two or more races 14.7%
 - Lowest: Asian 3.6%
 - White: 8.2%....African American 10.1%

What are they using...





Every drug has two effects....

The one you know about and...
The one you don't!



Prescription Drugs

Pain relievers, CNS depressants and Stimulants



New Trend??

- Next to marijuana, the most common illegal drugs teens are using to get high are prescription medications
- Belief in the myth that these drugs provide a medically safe high

Prescription drugs are most commonly abused among which age group??

12-13 year olds!!



Opiates

- Examples: Tylenol w/codeine, Oxycodone (OxyContin), Percocet, hydrocodone (Vicodin)....
- Oxycontin and Vicodin are the most commonly abused prescription drugs by teens.



Opiates

- Medical Uses: used to treat pain
- Method of Action: Opioids attach to opioid receptors in the central nervous system (brain and spinal cord), preventing the brain from receiving pain messages.
- Signs of Abuse??
- Signs/Symptoms of overdose??
- Pre-hospital Treatment??

OxyContin



Street Names: Killers, OC, OXY, Oxycotton, Hillbilly Heroin .



Street Name: Coties

Tylenol® with Codeine

No. 2 15 mg

No. 3 30 mg

No. 4 60 mg

THIS IMAGE IS A REPRESENTATION ONLY. ACTUAL APPEARANCE MAY DIFFER.
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CNS Depressants

- **Examples:** diazepam (Valium), alprazolam (Xanax) and lorazepam (Ativan)
- **Medical Uses:** used to treat anxiety, tension, panic attacks and sleep disorders.

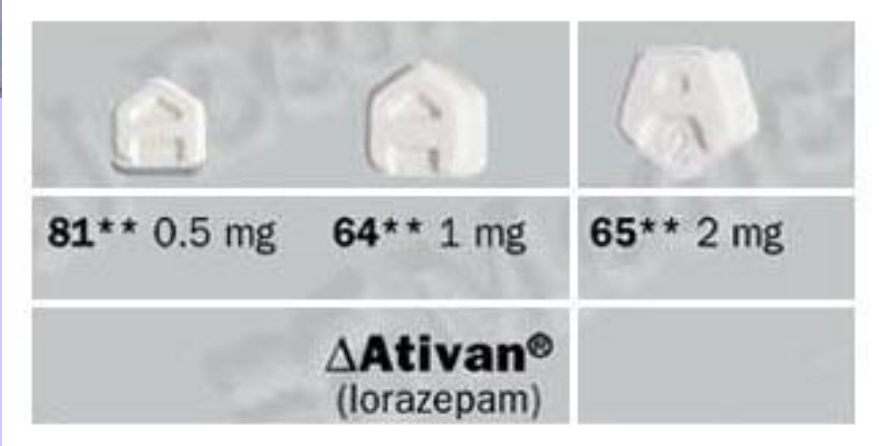


CNS Depressants

- Method of Action: CNS depressants slow down brain activity by increasing the activity of a neurotransmitter called GABA. The result is a drowsy or calming effect.
- Many times these are called “downers”.
- Signs of Abuse?
- Signs and symptoms of overdose??
- Pre-hospital Treatment??



Street names: vallies, downers, tranks,



Stimulants





Stimulants

- **Examples:** methylphenidate (Ritalin) and amphetamine/dextroamphetamine (Adderall)
- **Medical Uses:** prescribed to treat individuals who are diagnosed with ADD or ADHD. Also used to treat narcolepsy.

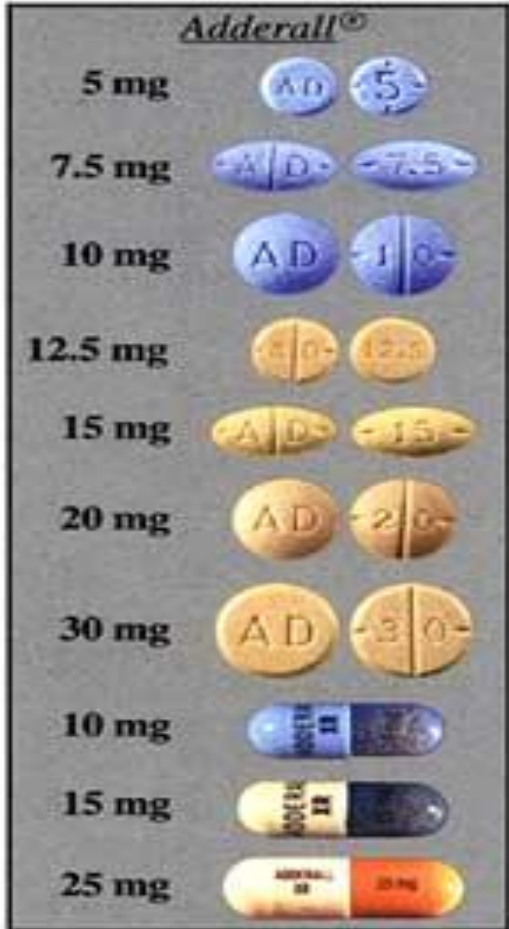


Stimulants

- Effects are similar to, but more potent than caffeine and less potent than amphetamine.
- Method of Action: Increases dopamine levels in the brain thereby increasing brain activity, resulting in greater alertness, attention and energy.
- Signs of Abuse?
- Signs/Symptoms of overdose??
- Pre-hospital Treatment?



Street names: Vitamin R, smarties, kibbles and bits, kiddy cocaine





OTC Medications

Dextromethorphan (DXM)



Dextromrthorphan (DXM)

- Found in any cold medicine with “DM” or “Tuss” in the name.
- **Examples:** Robitussin, Coricidin Cough and Cold,
- Medical Uses: used as a cough suppressant. When taken according to directions, it has few side effects.



Dextromethorphan (DXM)

- Method of Action: exhibits cough suppressant functions by activating specific opioid receptors in the central nervous system. In this sense, DXM functions like Ketamine or PCP.
- Signs of abuse?
- Sign/Symptoms of Overdose?
- Pre-hospital treatment?



Street Names: Triple C, Robo-tripping Skittling



Inhalants





Inhalants

- Found in ordinary household products that are inhaled or sniffed to get high.
- Examples: nail polish remover, hair spray, freon, spray paint, the propellant in aerosol cans, permanent markers.
- Products are bagged (fumes inhaled from a bag), huffed (inhalant soaked rag) or ballooned (huffing gases from inside a balloon).



Types of Inhalants

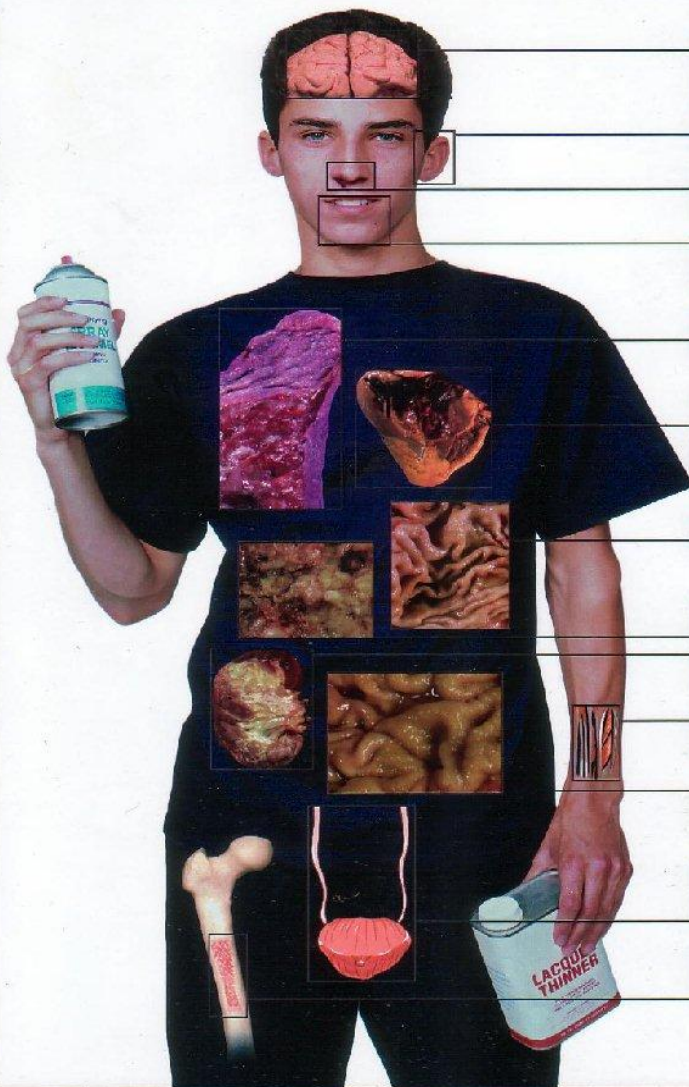
- **Volatile solvents:** liquids that become a gas at room temperature
- **Gases:** include medical gases and household or commercial products
- **Aerosol sprays:** most prevalent inhalants in the home
- **Nitrates:** found in some room deodorizers and capsules that release vapors when opened



Inhalants

- Within seconds of inhalation, the user experiences intoxication along with effects similar to those produced by alcohol.
- Signs of abuse?
- Signs/Symptoms of overdose?
- Pre-hospital Treatment?

INHALANTS



HARMFUL EFFECTS

**PERMANENT
BRAIN DAMAGE
MEMORY LOSS**

**HEARING
LOSS**

**NOSE BLEEDS
LOSS OF SMELL**

**SLURRED
SPEECH**

**SUFFOCATION
SUDDEN DEATH**

**IRREGULAR
HEART BEAT
HEART ATTACK
AND DEATH**

**NAUSEA AND
VOMITING**

**LIVER
DAMAGE**

**KIDNEY
DAMAGE**

**MUSCLE WEAKNESS
AND CRAMPING**

**ABDOMINAL
PAIN**

**INVOLUNTARY
PASSING OF
URINE & FECES**

**BONE MARROW
DEPRESSION**



How Inhalants Kill

- “Sudden Sniffing Death”
- Asphyxia
- Choking
- Suffocation

Street Names: Laughing gas, locker room, medusa, moon gas, poppers, whippits



Steroids





Steroids

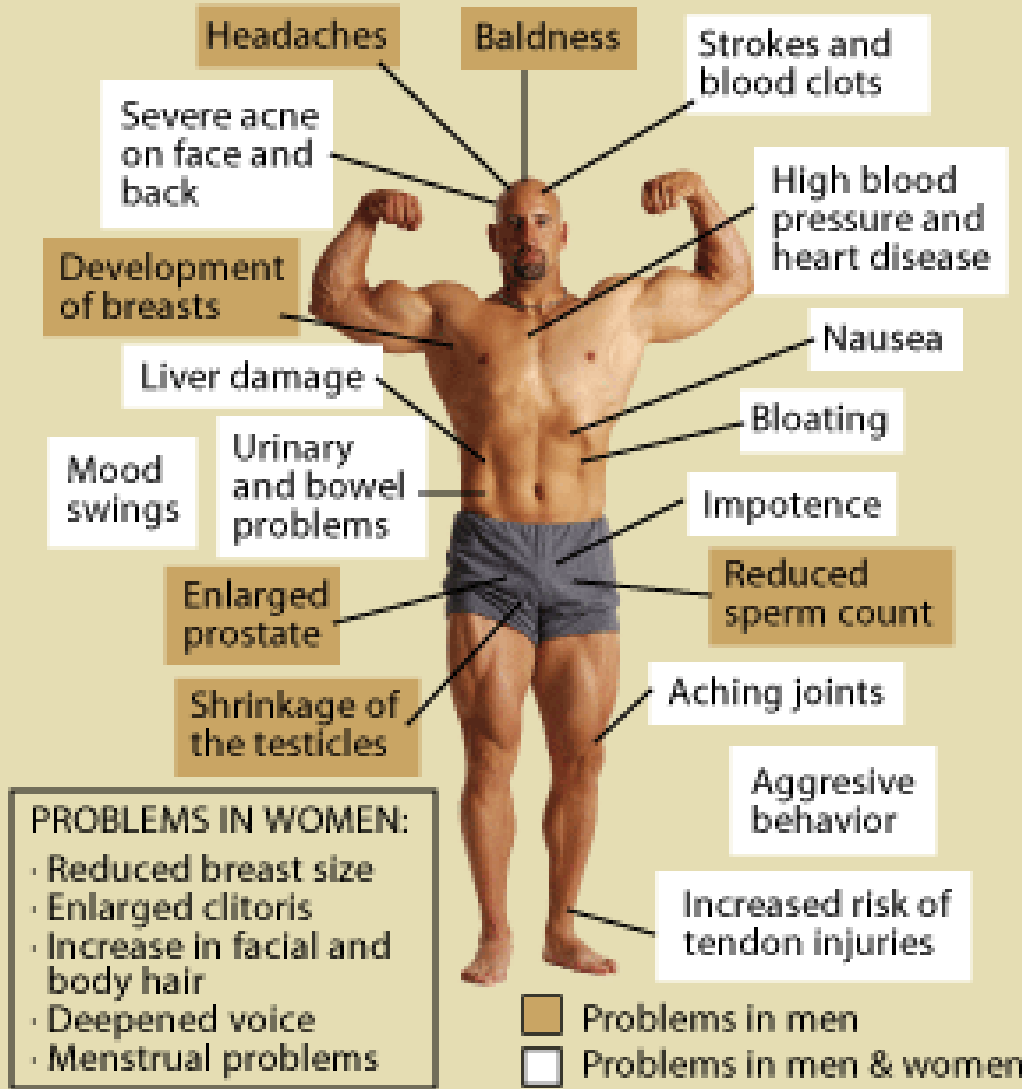
- Anabolic-androgenic steroids are usually synthetic substances similar to testosterone.
- Examples: HCG, Deca-Durabolin
- Medical Uses: given to adolescent males with pituitary malfunction affecting growth. Also given after certain kinds of surgery and cancer, usually to help build up muscle tissue.



Steroids

- Method of Action: effect on muscle mass is caused in two ways-
 - Increase the production of proteins
 - Reduce recovery time by blocking the effects of cortisol on muscle tissue
- Signs of Abuse?
- Signs/Symptoms of overdose?

Potential Negative Side Effects





Common Drugs Overdosed

Tylenol, NSAID, BetaBlockers and
Cyclic Antidepressants



Tylenol (acetaminophen)

- Acetaminophen is found both in other OTC medications and in prescription medications
- One of the most common medications found in households, thereby holding a high risk of overdose (whether on purpose or by accident)

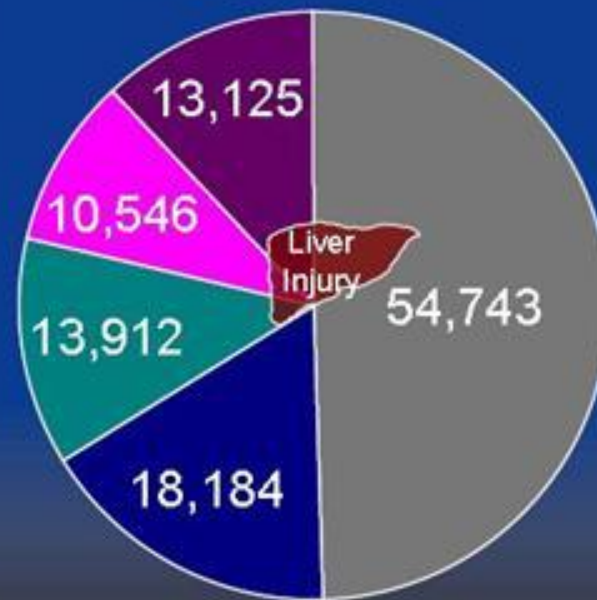


Tylenol (acetaminophen)

- Method of Action: Although the exact site and mechanism of analgesic action is unknown, acetaminophen appears to produce analgesia by elevation of the pain threshold. Also serves as an antipyretic.
- Dosage: not to exceed 4 grams in a 24 hour period regardless of strength/type for age 12 and older.

Annual Estimates of Acetaminophen-Related Emergency Department Visits by Cause, United States, 2006-2007*

Cause	Percent
Self-Harm	50%
Side-Effects	17%
Allergic Reactions	13%
Unsupervised Child Ingestions (<10 yrs)	10%
Other Unintentional Overdoses	12%



Tylenol Overdose

- Acetaminophen in overdose can seriously damage the liver. If the damage is severe, a liver transplant may be necessary in order to save a life.
- Signs of overdose?
- Treatment?





NSAID

- Nonsteroidal Anti-inflammatory Drugs
- Include ASA and ibuprofen containing products.
- Method of Action: NSAIDs work by reducing inflammation. They do this by blocking a key enzyme of inflammation called cyclooxygenase, which converts arachidonic acid to prostaglandins and leukotrienes. Prostaglandins cause local inflammation.
- Dosage: Depends on type of medication

NSAID

- NSAIDs in overdose can cause severe renal failure, liver failure and platelet dysfunction.
- Signs of overdose?
- Treatment?





Beta-Blockers

- Type of drug used to treat high blood pressure.
- Prescription beta-blockers are sold under various names, but the generic name always has “olol” in it. Ex: Metoprolol or atenolol.



Beta-Blockers

- Method of Action: the main ingredient is a beta-adrenergic blocking substance. It blocks the effect of epinephrine, thereby slowing the heart rate.
- Dosage: depends on the specific drug, however, overdose occurs when someone accidentally or intentionally takes more than the recommended amount.



Beta-Blockers

- Beta-Blocker overdose in children commonly causes hypoglycemia and can lead to nervous system symptoms.
- Signs of overdose?
- Treatment?



Cyclic Anti-depressants (TCA)

- Used to treat depression, OCD, ADHD, chronic pain and migraine prophylaxis.
- Remain second only to analgesics as the most common drug implicated in overdose fatalities.
- **Examples:** amitriptyline (Elavil), Pamelor, Tofranil



Cyclic Anti-depressants (TCA)

- Method of Action: inhibit the reabsorption of serotonin and norepinephrine by brain cells. To a lesser extent, TCA's also inhibit reabsorption of dopamine.
- Dosage: depends on the specific medication.
- Signs of overdose?
- Treatment?



SOP Review

Pediatric Toxicologic Emergencies

PEDIATRIC TOXICOLOGIC EMERGENCIES

BLS/ALS

STABLE: alert, normotensive

1. Pediatric Initial Medical Care

- HazMat precautions
- Do not initiate vomiting
- Contact Medical Control
- Initial interventions per Medical Control as indicated for identified exposure
- For altered level of consciousness or seizures, refer to appropriate SOP
- Support ABCs
- Keep warm
- Observe
- Bring container(s) of drug or substance to the ED
- Transport

ALS

UNSTABLE: altered mental status, airway compromise, and/or hypoperfusion

1. Pediatric Initial Medical Care

- HazMat precautions
- GCS ≤ 8 and evidence of airway compromise; **CONSIDER INTUBATION / ADVANCED AIRWAY INSERTION.**
- Consider delaying intubation if known narcotic exposure.
- The use of Alternative Airway is contraindicated if ingestion of caustic substance.

NARCOTIC OVERDOSE OR unknown etiology with respiratory compromise

2. Protect airway and increase FiO₂ oxygen by mask or assist with BVM
3. Administer Narcan IV / IO / IM / IN
 - < 20 kg **NARCAN 0.1 mg/kg**
 - ≥ 20 kg **NARCAN 2.0 mg**
- Consider **NARCAN** before intubation if able to maintain airway and ventilate

CYCLIC ANTIDEPRESSANT OVERDOSE

Hypoperfusion associate with wide QRS complex (possible cyclic ingestion)

2. **IV FLUID BOLUS (20 mL/kg)** increments
3. **SODIUM BICARBONATE 8.4% 1 mEq/kg IV**

BETA-BLOCKER / CALCIUM CHANNEL BLOCKER OVERDOSE

Hypoperfusion associated with bradycardia (possible Beta Blocker or Calcium Channel Blocker ingestion)

2. **GLUCAGON 0.5 mg IV/IO.** May repeat x 1

POTENTIAL EXPOSURES

Burning overstuffed furniture	= Cyanide
Old burning buildings	= Lead fumes and Carbon monoxide
Pepto-Bismol™ like products	= Aspirin
Pesticides	= Organophosphates & Carbamates
Common Plants	= Treat symptoms and bring plant/flower to ED

SMELLS

Almond	= Cyanide
Fruit	= Alcohol
Garlic	= Arsenic, parathion, DMSO
Mothballs	= Camphor
Natural gas	= Carbon monoxide
Rotten eggs	= Hydrogen sulfide
Silver polish	= Cyanide
Stove gas	= Think CO (CO and methane are odorless)
Wintergreen	= Methyl salicylate

ORGANOPHOSPHATE POISONING - excessive body secretions

D – Diarrhea	OR	Salivation (excessive production of saliva)
U – Urination		Lacrimation (excessive tearing)
M – Miosis		Urination (uncontrolled urine production)
B – Bronchorrhea / Bronchospasm		Defecation (uncontrolled bowel movement)
B – Bradycardia		Gastrointestinal distress (cramps)
E – Emesis		Emesis (excessive vomiting)
L – Lacrimation		Breathing Difficulty
S - Salivation		Arrhythmias
		Miosis (pinpoint pupils)

2. **ATROPINE 0.02 mg/kg (minimum 0.1 mg) rapid IV/IO q 3 minutes (no dose limit)**

CYANIDE POISONING - For known cyanide poisoning;

2. **AMYL NITRITE capsule broken and taped inside HIGH FiO₂ OXYGEN MASK or HIGH FiO₂ BAG MASK** and begin transport. Replace capsules q 1 minute x 12 capsules.
3. **INTUBATE** only if patient apneic after all 12 capsules used.
4. If hypotensive or pulseless, **IV FLUID BOLUS 20 mL/kg**
 - If no response to initial fluid bolus, **repeat fluid boluses 20 mL/kg**. May repeat x 2 to a maximum of 60 mL/kg.

CARBON MONOXIDE POISONING

- **HIGH FiO₂ OXYGEN BY MASK or ASSIST WITH HIGH FiO₂ BAG MASK**
- Do not rely on pulse oximetry
- Keep patient as quiet as possible to minimize tissue oxygen demand

SUSPECTED CLUB DRUG OVERDOSE

Contact Medical Control for suspected use of club drugs

Narcotics:

Morphine, Demerol, Heroine, Methadone, Codeine, Fentanyl, Vicodin, Hydrocodone, Dilaudid, Darvon, Percocet, Lortab, OxyContin, Duragesic patch

Cyclic Antidepressants:

Elavil (amitriptyline), Norpramin (desipramine), Tofranil (imipramine), Pamelor (nortriptyline), Sinequan (doxepine)

Benzodiazepines:

Halcion, Ativan, Restoril, Versed, Valium, Xanax, Librium, Klonopin, Dalmane, Rohypnol, Ambien

Beta Blockers:

Inderal (propranolol), Corgard, Lopressor, atenolol, Tenormin, Timolol

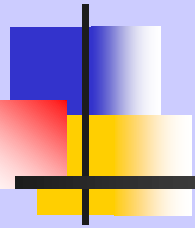
Calcium Channel Blockers:

Cardizem (diltiazem), Procardia (nifedipine), Calan / Adalat / Isoptin (verapamil), Norvasc (amlodipine)

Club Drugs:

GHB (Liquid G, Liquid Ecstasy), ketamine (Special K, Vitamin K, Super K), MDMA (Ecstasy, XTC, ADAM, E), Foxy Methoxy, AMT, Coricidin (Triple-C)

Poison Center: 1-800-222-1222



Drug of the Month

Narcan
Glucagon

Narcan (naloxone)

- Action: binds the opioid receptor and blocks the effect of narcotics
- Indications: Narcotic overdoses, reversal of administered narcotics
- No contraindications
- Adverse reactions: withdrawal symptoms, tachycardia, HTN, seizures





Narcan- Dose/Route

- Adult dose:

2mg IV/IN repeat q 5min

- Pediatric dose:

<20kg 0.1 mg/kg IV/IO/IM/IN

>20kg 2.0mg IV/IO/IM/IN



Glucagon

- Action: Causes a breakdown of stored glycogen into glucose. In high concentrations, it results in an increase in cyclic AMP and thus, increased inotropic and chronotropic effects and improved AV conduction.
- Indications: hypoglycemic pt. with no IV access. Beta or calcium channel blocker OD with symptomatic bradycardias including AV block

Glucagon

- Contraindications: hypersensitivity to glucagons or proteins
- Adverse Reactions: nausea, vomiting, dizziness and headache





Glucagon-Dose/Route

- Adult:

Diabetic Emergencies- 1mg IM

Beta/Ca Channel OD- 1mg slow IV

- Pediatric:

Diabetic Emergencies->8 yo:1mg IM

< 8 yo: 0.5mg IM

Beta/Ca Channel OD- 0.5mg IV/IO



EKG strip of the Month

Wide QRS Complex
Prolonged QT



Wide QRS Complex

- Causes: LBBB and RBBB, Wolf Parkinson White, Digoxin or TCA overdose, VT, V-fib
- Produced due to asynchronous ventricular depolarization secondary to a block or delay in the His Purkinje system.
- Characteristics:
 - QRS duration of $>.12$ seconds
 - HR may be normal or tachycardic
- Treatment depends on patient presentation, stability and history

Vent. rate 100 bpm
PR interval * ms
QRS duration 152 ms
QT/QTc 472/408 ms
P-R-T axes 84 22 78

Sinus rhythm with AV dissociation and wide QRS rhythm with frequent, and consecutive premature ventricular complexes and fusion complexes
Nonspecific intraventricular block
Abnormal ECG

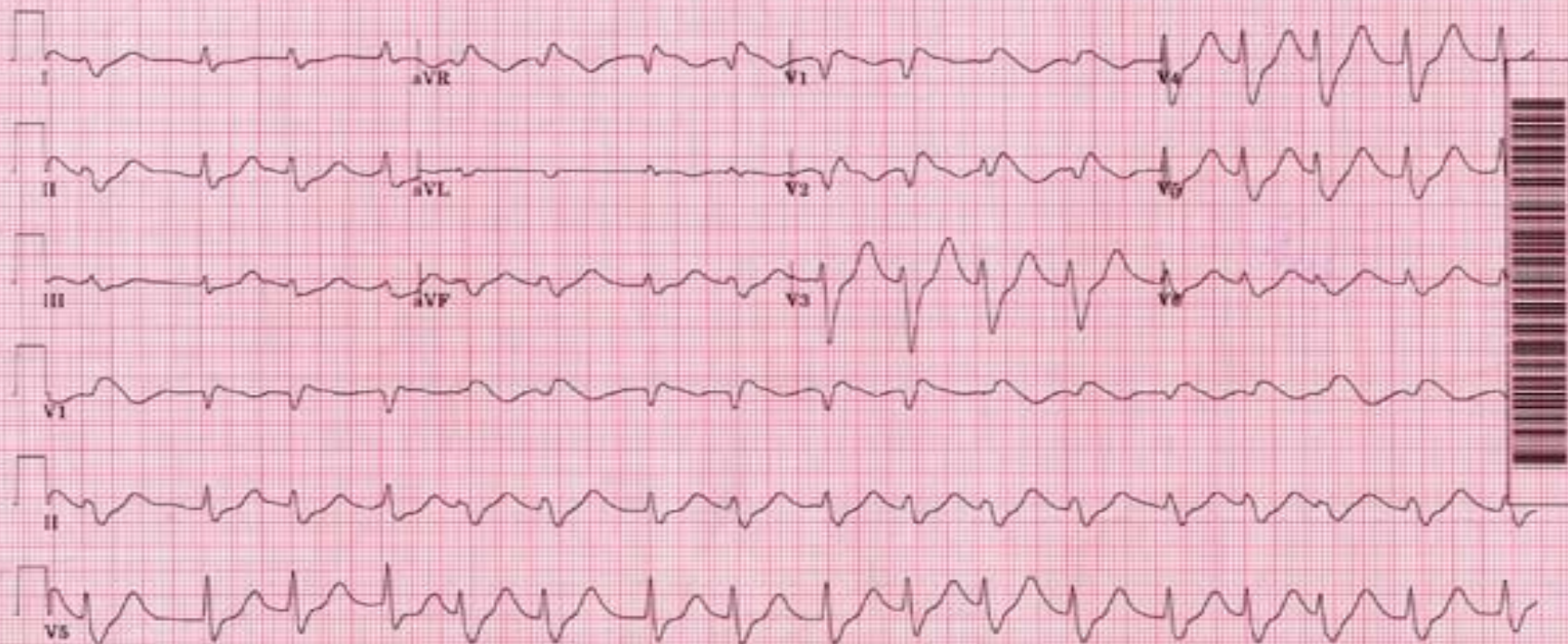
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Room: 2

Technician: LN
Test ind: OD

Referred by:

Unconfirmed



150 Hz 25.0 mm/s 10.0 mm/mV

4 by 2.5s + 3 rhythm lds

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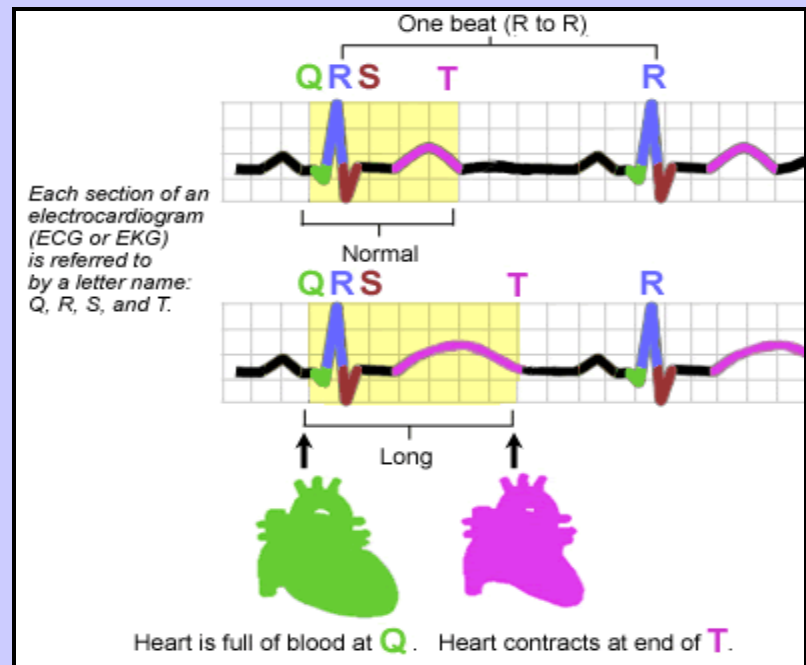
NEPHAL MEDICAL

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III

Prolonged QT

- Causes:
 - Inherited: due to gene mutation.
 - Acquired: most often due to the administration of certain medications.
- Characteristics:
 - QT interval >.44 seconds

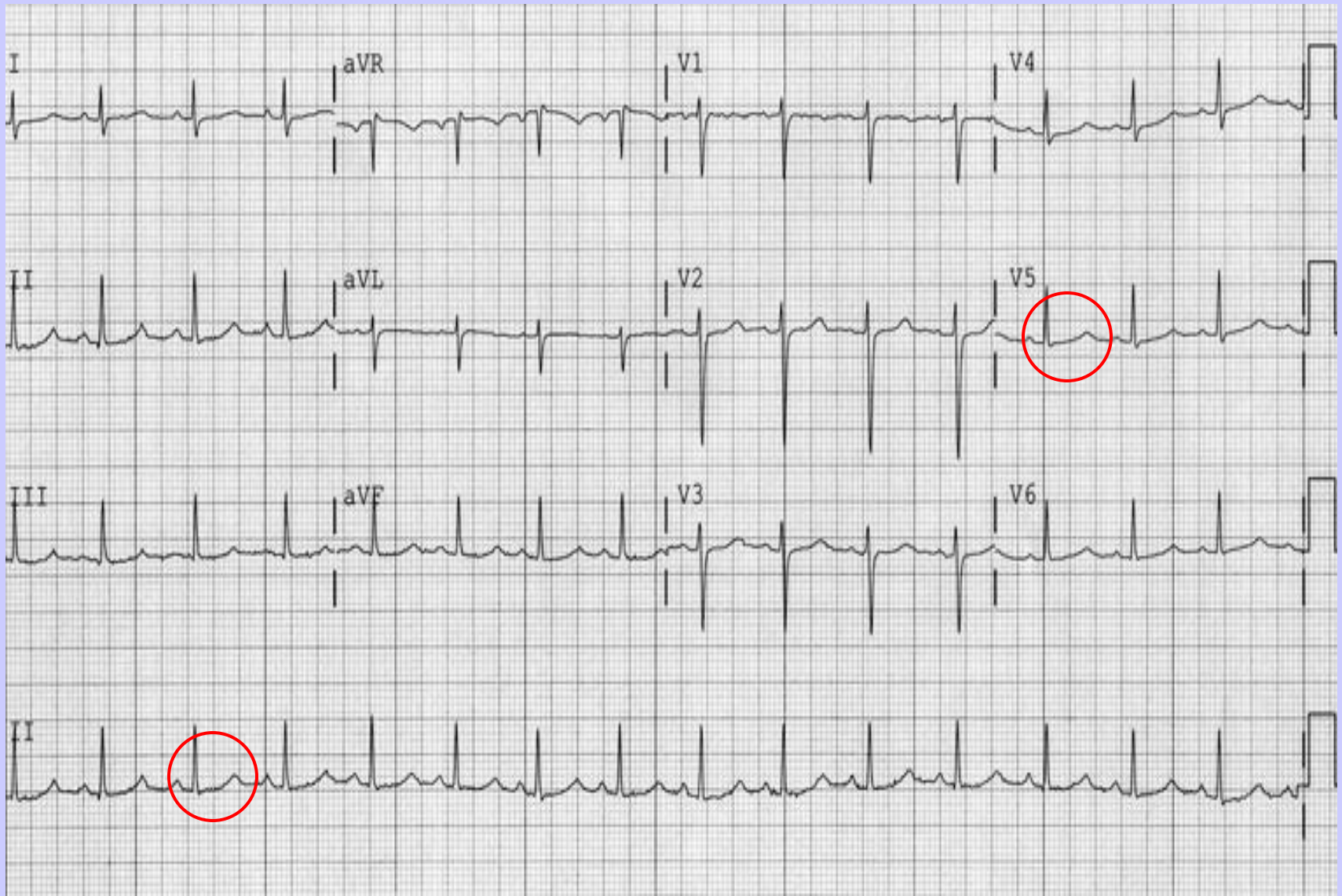




Prolonged QT

- The duration of the QT-interval is a measure of time required for depolarization and repolarization to occur. In prolonged QT the duration of repolarization is longer than normal.

Why is this a problem ???





Prolonged QT

- Treatment : varies based on patient presentation and history. For pre-hospital providers it is important to remember that if your patient has a prolonged QT interval, they are at risk for a lethal arrhythmia...so prepare yourself!



Questions????
