Drug abuse is a major public health problem. The illegal status of the classical recreational substances such as marijuana, cocaine, opioids, and methamphetamine has encouraged users to seek newer “designer” drugs and other substances that offer the advantages of being legal, less expensive and having more desirable pharmacological effects. Health care providers, both prehospital and in-hospital need to be aware of the emerging trends of drug use in their own communities and be up to date and well-informed on these new recreational “designer” drugs.

Designer drugs created for recreational use may have stimulatory effects, ecstasy-like effects, and/or hallucinogenic properties. They have become increasingly popular among recreational drug users. Internet sale and distribution has made these drugs more easily available presumably allowing substantial profits to be made before the market can be limited by legal regulations. The substances used change frequently in response to market trends and legislative controls.
The rapid and widespread distribution of these drugs has also resulted in a substantial increase in the number of people seen by EMS providers and in emergency departments for treatment of acute toxic reactions. The contents of designer drugs purchased on the internet vary over time and may include chemicals not listed on the label. In addition, the name of the drug may vary from location to location and may not be indicative of the contents of the package. Users are often unaware of what or how much they are taking. Reliable clinical and experimental data are not available for many of these substances.

**Alcohol**

Alcohol is a legal depressant that affects vision, judgment, reaction time, and memory. The effects of alcohol vary from person to person, some become quiet or depressed while others become aggressive and argumentative. The amount of alcohol consumed may play a part in the effects as well. Long-term users can develop tolerance wherein the physical signs of misuse may not be easily identified. Alcohol in the blood rapidly enters every organ and every cell. It directly affects the brain and is probably more toxic to the developing brain of the adolescent. The toxic metabolic byproduct of ethanol, acetaldehyde, can be found in the brain. Acetaldehyde, and its metabolic product, acetate, damages brain cells, affecting the function of these cells and resulting in cell injury or death.

Withdrawal may occur in chronic users and in binge drinkers and is due to an imbalance of two neurotransmitters: GABA (inhibitory) and glutamate (excitatory). Common symptoms are headache, nausea and vomiting, sweating and hypertension. In more severe cases, confusion, hallucinations, delirium tremens (DT's) and seizures may occur. DT's are particularly dangerous. The death rate is 5% in treated individuals and 35% if untreated.

**Indicators Suggestive for Alcohol Consumption:**

- Difficulty in recalling instructions
- Shortened attention span
- Thick, slurred speech
- Sluggish, sleepy
- Slowed reactions
- Uncoordinated & unsteady gait
- Faulty judgment
- Lack of coordination
- Greatly impaired driving ability

**Hangover indicators include** headaches, nausea, dehydration, unclear thinking, unsettled digestion, aching muscles, slow moving, unmotivated
**Alcohol consumed with other drugs**
In an attempt to get more “high,” users mix alcohol with other substances. Combination use is common among adolescents and college-age students.

**Alcohol and caffeine**
Abuse of the combination of alcohol and caffeine is dangerous and may be deadly. Commercially available energy drinks with 12% alcohol are available in liquor stores and are common at teen parties. These drinks are in bright colored cans and marketed to kids. Some examples include Four Loko, Joose, Jilt, and Tilt.

![Caffeine In Energy Drinks chart](https://www.myhealthnewsdaily.com/)

Alcohol is often mixed with high-caffeine energy drinks to achieve the same effects, i.e. Amp and Everclear, Rock Star with Vodka or Rum, and “car bombs” made from Red Bull and Yagermeister. Caffeine masks the effects of alcohol and the user keeps drinking, often until he/she passes-out. Caffeine/alcohol drinks are being considered for regulation. However, a caffeine-containing inhaler, Aero Shots, has hit the market and is being used in combination with alcohol.
**Alcohol and Adderall (ADDYS)**
The combination of Adderall and alcohol is often described as a “safe” replacement to cocaine and alcohol but combining these may have deadly consequences. Many adolescents and young adults are using this mixture as a party drug cocktail that allows them to extend their partying. When Adderall is “abused” by snorting or smoking it acts as a stimulant like methamphetamine and it counteracts the depressive effects of alcohol.

When Adderall and alcohol are combined, a number of things happen. Because Adderall masks the depressive feelings created by alcohol, many users tend to ignore warning signs of excessive alcohol intake and physical harm. Repeated use of this cocktail can lead to psychological issues such as paranoia, anxiety, and severe depression. Physically, it can cause nausea, vomiting, weight loss, heart palpitations, and headaches. If used over a long period of time, users may experience convulsions, arrhythmias, fevers, malnutrition, tremors, and muscle twitching.

**Drinking Hand Sanitizer**
In an effort to get drunk, teens have turned to drinking hand sanitizer. These products contain about 60% - 65% alcohol (typically ethyl alcohol) along with other ingredients, including a gelling agent. The gelling agent is easily removed by adding a “dash” of table salt to the container. The gelling agent precipitates and the alcohol is decanted and consumed. Not all hand sanitizers contain ethanol. Some may contain denatured ethanol (added chemical agents or methanol), isopropyl alcohol or methanol. Ingestion of isopropyl alcohol or methanol is serious and may result in brain or kidney damage or blindness.

**Tampons soaked in Alcohol**
Teens are soaking tampons in alcohol and inserting them, boys use them rectally and girls vaginally. This hides the odor of alcohol on the breath, and prevents detection of use. If enough alcohol is absorbed, indicators of intoxication will occur. Teens and college students are also using Alcohol as an enema. This results in fast absorption through the intestines, and thus resulting in a dangerously high blood alcohol level. This is extremely dangerous. It has been popularized by videos on YouTube and from a song by NOFX called “party enemas.”

**Vaporization**
A new device, Alcohol Without Liquid (AWOL), is now available in the US. The device vaporizes alcohol so that it may be inhaled. The AWOL device consists of two components: an oxygen generator and a hand-held vaporizer. Tubes from the generator attach to the vaporizer. Alcohol (typically vodka) is poured into the vaporizer, mixes with room air producing an alcohol-mist. The mist is inhaled resulting in rapid absorption of alcohol from the lungs and immediate intoxication.
Teens may make their own AWOL device using a plastic bottle, plastic or rubber tubing and a hand held air pump. Alcohol is poured into the 1-2 liter plastic bottle which is fitted with a stopper. An inflation-pin typically used for inflating basketballs is inserted through the stopper. A tire pump is connected to the pin and air is pumped into the bottle until the bottle is firm. The stopper is pulled and vaporized alcohol, typically vodka, flowing from the opened bottle is inhaled. The user quickly becomes intoxicated.

**Synthetic psychotropic drugs sold as “research chemicals”**

There is a wide variety of synthetic drugs available in convenience stores, “head shops/smoke shops” and on the internet. All are legal and available without a prescription. These drugs are typically labeled “not for human consumption” and are sold as some sort of plant fertilizer, plant food, “bath salts,” or incense. These drugs are generally produced in sophisticated laboratories. The FDA and DEA ban these drugs as they become aware of them. However, with a slight alteration of the chemical structure, that does not affect the drugs activity, a “new” drug (not banned) is created and sold until the federal agencies can prohibit their sale. All are dangerous and deaths have been reported following their use. Users describe effects mimicking LSD, mescaline, methamphetamine and cocaine. The effects may be immediate and last several minutes to several hours to several days.

These drugs are available under a wide variety of names: Spice, K-2, Red Rocket, “bath salts”, 2 C-E, Bubbles, Bromodragonfly, and Tootsie. All are dangerous and deaths have been reported following the use of some of these agents. They have a variety of effects, ranging from euphoria to hallucinations. Users describe effects as marijuana-like, or a combination of effects mimicking LSD, Mescaline, Methamphetamine, and Cocaine. These drugs may be ingested, smoked, or snorted and the effects may be immediate and last several minutes to several hours to several days. Examples of these drugs are listed below.

**Synthetic Cannabinoids “pot”**

Synthetic cannabinoids are chemicals that are structurally and functionally similar to tetrahydrocannabinol (THC), the primary cannabinoid in marijuana. They bind to cannabinoid receptors in the brain and are more potent binders than is THC. More than 200 synthetic cannabinoids have been identified. The first synthetic Cannabinoid, JWH-018, was created by a doctor at Clemson University to look at the endo-cannabinoid system of the human brain. This chemical has been purchased on the internet as a powder, mixed with alcohol or acetone and sprayed onto plant materials, tea leaves, or herbs and sold as an “incense” or “potpourri.” Use causes similar affect as smoking MJ, however, the high is short lived followed by headache. JWH-018 has never been tested on humans, but animal studies show it can cause cerebral hemorrhages and heart
arrhythmias. Abusers smoke or ingest the products to experience effects similar to those induced by marijuana. However, the high is short lived followed by a headache. Small doses of these drugs have an intense effect. Like marijuana, synthetic cannabinoids induce a state of relaxation, happiness, and euphoria. However, these effects are accompanied by significant anxiety, restlessness, aggression, altered perception, sweating, and nausea. Other reported effects include headaches, dizziness, tachycardia, agitation, irritability, aggressiveness, difficulty in articulating words caused by impairment of the muscles used in speech, eyes open and awake yet unresponsive, twitching and muscle jerks, paranoia, anxiety, and seizures.

The composition of these drugs varies and the side effects, especially the effects on emotions and personality are unpredictable. Severe psychiatric problems including severe depression, and schizophrenia, and catatonia have been reported. No antidote is available. Fortunately the effects are short acting and self-limited.

Synthetic Pot is sold as “K2,” “Spice,” “Aroma,” “Mr. Smiley,” “Zohai,” “Eclipse,” “Spike Max,” “Mr. Nice Guy,” “Black Mamba,” “Red X Dawn,” “Blaze,” “Dream,” “Colorado Chronic”, “Blueberry Mamba”, and others. They are now classified as schedule 1 controlled substances under federal law. The problem is as the government or states try to regulate these substances, manufacturers alter an existing cannabinoid by one molecule. Meaning they twist a carbon, remove hydrogen, add an oxygen, bromide, methyl group, etc. With a slight alteration of the chemical structure, that does not affect the drugs activity; a “new” drug (not banned) is created and sold until the federal agencies can prohibit their sale. Because the synthetic cannabinoids are being altered, they do not test in urine.

Recently, acute kidney injury has been reported to occur in adolescents. In some cases treatment with short-term dialysis is required. All cases have resolved without evidence of chronic kidney damage. The kidney damage is due to a toxin present in some types of synthetic marijuana due to the manufacturing process, and when the compound is broken down by the liver.

**Synthetic Opiates**

Desomorphine (Dihydrodesoxymorphine or dihydrodesoxymorphine-D) is a synthetic morphine analogue synthesized in the 1930s in the United States. Its street names are “Krokodil” and “Crocodil”. Desomorphine produces an opiate-like action with a fast onset and brief action. As a powerful morphine derivative, it is about ten times more potent than morphine.

Desomorphine abuse first appeared internationally in 2002. The skin, in long-term abusers of desormorphine, may present as greenish and scaly due to damaged blood vessels, thrombosis and damaged soft tissues surrounding the
injection sites. The skin’s appearance is similar to a crocodile’s scaled and rugged skin. The skin injuries can eventually develop into severe tissue damage leading to thrombophlebitis and gangrene. These conditions usually result in limb amputation or sometimes death.

Desomorphine is abused for its opioid-like effects. As with most opiates, abuse of desomorphine is associated with tolerance, dependence and addiction. As a cheaper alternative to heroin in drug abusers, desomorphine abuse was reported in 2009 to be increasing among Russian young adults. Desomorphine is illicitly synthesized from codeine by abusers. Desomorphine is generally abused intravenously.

**Designer drugs/ “Research Chemicals”**

The major change in the pattern of recreational drug abuse has been the use of synthetic cathinones, which are central nervous system (CNS) stimulants and typically marketed as “bath salts” or “plant food,” and sold under various brand names throughout the United States. These designer drugs are phenethylamines and when chemically altered (substituted) create a variety of psychoactive substances such as amphetamines, methamphetamine, MDMA (ecstasy), cathinones, and, mephedrone. The clinical effects vary and may be stimulatory, ecstasy-like (entactogenic), or hallucinogenic. Most of these drugs act at multiple CNS receptor sites and either inhibit presynaptic uptake of dopamine or release serotonin or act as serotonin agonists.

**“Bath Salts”**
**Phenethylamine Bath Salts**

This family of monoamine alkaloids includes methamphetamine and MDMA. “Designer” substitutions have created substances with additional psychotropic effects. These drugs are primarily stimulants but also have some hallucinogenic properties and inhibit plasma membrane catecholamine uptake transporters. They are typically ingested, snorted, or injected. These agents are stimulants at lower doses and hallucinogenic at higher doses, users can have psychotic episodes that result in death. These synthetic compounds are dangerous and have been reported to cause users to commit suicide. Because they are in the Ecstasy/Methamphetamine family, they can be addictive. Bath Salts are sold under such names as Ivory Wave, White Lightning, Cloud 9, Bliss, MDPV, and Scarface. Some of these brands have chemicals in them that have a half-life of four days. This means half of the chemical is removed from the body in four days, thus people that take these substance can have effects lasting multiple days.

The phenethylamines cause a euphoric high with a rush similar to that of cocaine, ecstasy, or methamphetamine. They act as an appetite suppressant while giving the user more energy. For these reasons, some high school and college students use these drugs believing they are beneficial for work or studying. The onset of effects is usually 15–45 minutes after ingestion and last approximately 2–5 hours. After snorting, effects occur in about 30 minutes and last approximately 2–3 hours. After an intravenous injection, the effects last approximately 10–30 minutes. Street names include Fly, Dragon Fly and Bromo-dragon Fly, 2C-I, Smiles, 2 C-E, Bubbles, and Tootsie.

Common side effects associated with these drugs include tachycardia, hypertension, dilated pupils, high temperature, hallucinations, suicidal ideation, paranoia, violence, seizures, and death. These substances have been linked to a number of deaths from prolonged arteriolar vasoconstriction. This effect may persist for days and result in sudden death from coronary artery constriction. Other complications include agitation, hallucinations, mydriasis, severe limb ischemia, seizure, liver failure, renal failure. Toxicity may be dose related.

Mephedrone, an increasingly popular synthetic cathinone, is chemically similar to cathinone, a Schedule I controlled substance that occurs naturally in the khat plant. The drug is cheap, available on line and delivered right to your door. Its effects are described as a “weird hybrid of MDMA and cocaine.” Street names for Mephedrone include M-CAT, Meow Meow, 4 MMC, or Drone. It is commonly ingested or snorted. Clinical features include agitation, tachycardia, anxiety, confusion, chest pain and nausea.

The majority of synthetic cathinones have little or no odor and are sold as a white, off-white, or yellowish powder in tablet form, capsules or in crystal form.
Abusers may ingest, inhale, inject, smoke, or snort the drugs to experience stimulant effects similar to those induced by amphetamines or cocaine. These drugs may be dissolved in water, atomized and inhaled, placed as drops in the eyes or sprayed in the nose to achieve a rapid onset of effects. Packages typically contain 300-500 mg of the powdered chemical. Most users assume that 300-500 mg is a normal dose, but in fact 10 mg or less is an effective dose. This unintentional overdose may result in severe hallucinations and serious side effects. According to the American Association of Poison Control Centers, calls to poison control centers regarding exposure to “bath salts” have increased from 303 cases in 2010 to 4,137 in 2011 (1,300 % increase).

**Non-Phenethylamine Bath Salts**
Due to the increased awareness by law enforcement officials, new types of “bath Salts” are being synthesized and are readily available. The primary ingredient in these new substances is alpha -- PVP). The compound is related to MDPV and mephedrone and has hallucinogenic effects. The mechanism of action is unknown. Street names include Cloud 9, MDPK, Magic, Black Rob and Super Coke.

Cosmic Blast is a new synthetic drug marketed as “jewelry cleaner” that is sold on the Internet and now available at some retail stores in the United States. Cosmic Blast reportedly contains two highly-dangerous stimulants - methylenedioxypyrovalerone (MDPV) and naphyrone. Naphyrone is also a stimulant that allegedly has similar effects to mephedrone. Naphyrone is sold under the brand name NRG-1 or Energy1 and is a crystalline white powder. It has emerged as a legal high and is marketed as a “mephedrone replacement.” Naphyrone allegedly works by over-stimulating the body's pleasure receptors while flooding the body with adrenaline. Little is known about its toxicology. Naphyrone, like other designer drugs, is usually marketed as a substance labeled “Not intended for human consumption.”

**Piperazines**
Piperazines are entirely synthetic and not present in nature. The most popular one is Benzylpiperazine known as BZP, Frenzy, A-2, or Nemesis on the street. BZP has become an alternative to Methamphetamine and Ecstasy. It is a Central Nervous System stimulant similar to the Amphetamines; however, users claim it is less desirable due to the many side effects from the drug. The effects are similar to amphetamines: dilated pupils, increase BP and heart rate, anxiety, blurred vision, and dizziness. Some chronic users reporting effects that include: irregular heartbeat, delusions, hallucinations, and paranoia. The high can last 6-8 hours and is similar to the high from Ecstasy. TFMPP is another synthetic piperazine often combined with BZP. BZP can be in pill form or a powder put into capsules. BZP is a sympathomimetic stimulant and acts like an amphetamine: increases extracellular CNS dopamine, serotonin and noradrenaline by both enhanced
neurotransmitter release and reuptake inhibition. This drug produces a sympathomimetic toxidrome including metabolic acidosis, seizures, toxic paranoid psychosis, hyponatremia

**Tryptamines**
Dimethyltryptamine, DMT, known as the “Spirit Molecule”, is a psychedelic compound in the tryptamine family and can be found naturally in many plants. The native people of Amazonian Peru consume DMT as the primary psychoactive in “Ayahuasca Tea” a brew used for divinatory and healing purposes. The vines of the plant used in the making of this tea have a natural MAO Inhibitor, thus allowing DMT to be orally active. When taken orally with an MAOI, DMT produces a long lasting, slow, deep metaphysical experience similar to that of psilocybin mushrooms.

Natural tryptamines are derived from tryptophan, serotonin, psilocybin, and melatonin. DMT occurs naturally in our brains and is known as the “Dream Drug”. Natural and synthetic tryptamines are hallucinogenic. Clinical effects of DMT include hallucinations and vomiting. DMT is a schedule 1 drug and illegal in the United States. However, its analog, 5-MeO-DMT is neither scheduled nor controlled and is easily purchased online. It is more potent than DMT, is generally smoked, and produces an intense high of short duration with hallucinations. The Sonoran Desert Toad naturally secrets 5 Meo-DMT and there have been many reports of people licking the toad to get high.

It is not uncommon for people to have psychological and mental difficulties lasting several weeks after taking too large a dose of 5-MeO-DMT. Too much can cause intense hallucinations, loss of connection to reality, disorientation, panic attacks, anxiety, sweating, and nausea. 5-MEO-DMT is known on the street as “Dimitri” and “The Businessman’s High”.

**Hallucinogenic and psychoactive plants**
Some of these plants, which include Morning Glory, Jimsonweed, Salvia, Angels Trumpet, and Horned Poppy, may be growing in your garden. All have active alkaloids that can cause hallucinations. They are easily smoked or ingested as a tea. Other plants may not be indigenous to the US but are available from drug dealers or the internet, e.g. Khat, Blue Lotus.

**Salvia**
Salvia Divinorum is perhaps the best known of the hallucinogenic plants and is readily available on line, at smoke shops, and in convenient stores, and is available in multiple concentrations. It is a very potent naturally occurring hallucinogen and is smoked, often in a water pipe, or ingested as a tea. Its effects include:
• Stimulating the recall of past memories, such as revisiting places from childhood memory
• Sensations of motion, or being pulled or twisted by forces
• Visions of membranes, films and various two-dimensional surfaces
• Merging with or becoming objects
• Overlapping realities, such as the perception of being in several locations at once
• Uncontrollable laughter

**Blue Lotus**

Blue Lotus is gaining in popularity. This plant grows along the Nile River and is sold online and in head shops as a concentrated tablet that looks like and acts like the tranquillizer Xanax. Xanax is a benzodiazepine that is prescribed to reduce anxiety and help with panic attacks. Often benzodiazepines are used to counteract the anxiety caused by illicit drug use. There is a new product called “Relax Max”, by Mr. Smiley, being sold legally in smoke shops, convenient stores, and online and looks just like Xanax. The first “inactive” ingredient listed in this product is Phenazepam. This is a benzodiazepine from Russia, so it is not regulated, monitored or detectable, but it can be purchased as a research chemical online. It is very pure and causes a high of 60 hours or longer. It also can cause amnesia, blackouts, dizziness and delirium. Mixing Benzodiazepines with Alcohol can be very dangerous.

**Kratom and Krypton**

Kratom is a plant common to Southeast Asia and Thailand and can act as both a stimulant (euphoria) and a sedative. At a low dose the user becomes talkative, energetic, alert, and excited. At a high dose the user’s pupils constrict, they are in a calm and dreamy state, less sensitive to pain, have a dry mouth, may itch, and can have nausea. At high doses this plant has an opioid-like effect and may be used to treat pain and opioid withdrawal. The plant material is widely available online and legal. Kratom is available in combination with another mu-receptor agonist and sold as Krypton. Krypton consists of powdered Kratom leaves mixed with O-desmethyltramadol, the active metabolite of tramadol. This combination is deadly.

**“Mr. Smiley” Products**

Mr. Smiley products are pills with varying amounts of plant material found in Asia, the Mediterranean and other parts of the world, as well as caffeine and amino acids. These products are sold as a “dietary supplement”, which means they are not regulated, monitored or tested by the FDA. These pills are sold under the names X-Rave, Auto Focus, Kratom (see above), Relax Max, (above) and Energy or Euphoria liquid shots. They can be found in smoke shops, convenient stores, gas stations and online. The claim on the packaging of many of these pills
states they can not be detected in urine, hair or blood sampling. This makes these products popular with those in the system or worried about being caught.

Anyone using these products needs to educate themselves about the plant materials found in the various pills. They have warnings on the labels because mixing the plant material in these pills with more caffeine products (energy drinks), alcohol, prescription drugs (especially SSRI / MAOI inhibitors) or other illicit drugs can very dangerous. Effects can vary depending on the pill taken, but can cause nausea and vomiting, increased heart rate and blood pressure, sweating, dehydration, hallucinations, anxiety and panic attacks, headaches, and constriction of the blood vessels leading to strokes and heart attacks. The plant materials contained in these pills have never been tested on humans, so users beware.

**Melatonin**

Melatonin is a naturally occurring compound found in plants and animals. It is present in humans and has a role in regulating the human sleep-awake cycle. It is available over the counter as a dietary supplement and is typically used as a sleep aid. It is also present in products such as Larry Cakes (the original “Relaxation Brownies”) and melatonin drinks at about 10 times the physiologic dose. At these doses melatonin causes fatigue, dizziness, irritability, disorientation, confusion and vivid dreams and nightmares. It is hypnotic and is said to have marijuana-like effects.

Melatonin is principally metabolized to 6-hydroxymelatonin and excreted in the urine. In higher doses melatonin is also metabolized using an alternative pathway that induces the enzyme M-O demethylase, which is important for the biosynthesis of estradiol, progesterone, prolactin and cortisol. This reaction results in undesirable effects in males including gynecomastia (breast enlargement in males), decreased sperm count and decreased sperm motility.

**Dextromethorphan DXM (Robo-Tripping)**

Dextromethorphan (Robitussin and other over the counter cough preparations) act as a hallucinogen when taken in large doses. People will drink multiple bottles of Robitussin, or eat boxes of cold medication at one time. The high is dose dependent. Delsym is a 12 hour cold medication and when consumed causes a 12 hour high. Robitussin is a 4-hour dose and thus the high from drinking Robitussin is 4 hours. Cold medication is easily accessible and popular with middle school and high school kids.

**Indicators of DXM use:**

- Impaired judgment and mental functioning
- Loss of coordination
- Hot flashes
- Numbness
- Increase heart rate and blood pressure
- Nausea & vomiting
- Seizures
- Dissociative state (like PCP)
- If the cold medication contains Tylenol, liver damage is likely
- Sensitive to light
- “Horrible Feeling”

**Detection in urine:**
Drugs have certain “detection windows” meaning the amount of time after ingestion that evidence of their use can be detected by a drug test. Alcohol is absorbed and eliminated more quickly than other drugs; therefore, many employers have post-accident testing procedures that require testing for alcohol to occur within two hours of the incident. Other drugs are eliminated from the body at different rates and thus detectable for different periods of time, often long after the drug’s effect has worn off. Some parents purchase home drug testing kits to randomly test their children.

The following are estimates of the length of time that certain drugs are detectable:
- Alcohol – 2-12 hours
- Amphetamines/Methamphetamine – 2-3 days
- Adderall / Ritalin – 2-5 days
- Bath salts – 4-7 days
- Barbiturates – 2-10 days
- Benzodiazepines – 1-6 weeks
- Cocaine – 2-10 days
  - Benzylecgonine - 2-4 days
  - Heavy use - up to 10 days
- Codeine – 2-4 days
- Ecstasy (MDMA) – 2-3 days
- Heroin - 1-3 days
- Morphine – 2-3 days
- LSD – 8 hours
- Marijuana
  - 1 time only – 5-8 days
  - 2-4 times month - 11-18 days
  - 2-4 times week – 23-35 days
  - 5-6 times week – 33-48 days
Daily use – 49-90 days
- Methadone – 2-3 days
- Phencyclidine (PCP) – 1 week
- Prescription Opiates – 3-5 days
- Suboxone – 2-7 days
- Synthetic Pot (K2 / Spice) – 4-7 days

*Oxycontin and other prescription opiates will not show up in a regular urine tox! You need to request the urine be quantified or request a five panel opiate test.

**Drug Paraphernalia**

Most people consider drug paraphernalia to be pipes, bongs and syringes, but it can be many things. It can be ordinary items used to disguise or hide the drug or things used to consume the drug. Aluminum foil, small ziplock baggies, pill bottles, spoons, film canisters, cigarette packs, hide-a-cans, makeup kits, gum wrappers, mint tins, liquid breath mint containers, or small glass vials are types of paraphernalia. Parents need to be aware that these kinds of things are either used to conceal the drug or a way of using the drug. Paraphernalia means drug user.

The following list identifies paraphernalia commonly associated with the use of specific drugs:

- **Ecstasy:**
  - pacifiers, lollipops, mouth guards for grinding of the teeth
  - glow sticks, surgical masks and mentholated rubs to over stimulate the senses
  - water bottles used to bring in alcohol or liquid drugs like GHB, LS
- **Cocaine:**
  - glass pipes for smoking crack
  - small mirrors and razorblades, rolled dollar bills or cut straws for snorting
  - spoons and lighters, syringes, tourniquets, cotton pieces
- **Marijuana:**
  - rolling papers, small baggies, stash cans, film canisters, tins and roach clips
  - deodorizers, incents, potpourri to disguise or mask the odor of marijuana
  - pipes – metal, colored blown glass, ceramic large bongs
  - brown dryer sheets – kids stuff them in an empty toilet paper roll and exhale smoke into it
- **Methamphetamine:**
  - small plastic baggies
- small cosmetics bags (to keep paraphernalia in)
- pocket knives
- Q-tips
- Cut straws
- Pocket torches
- Glass pipes
- Razor blades
- Mirrors

- **Inhalants:**
  - tubes of modeling glue or super glue
  - empty spray cans, small CO2 cartridges
  - plastic & paper bags, balloons, tops cut off of liter bottles
  - bottle or cans with pens or tubing punctured in the sides

**Things used to cover up the use of drugs:**
- mouthwashes, breathe sprays, mints
- eye drops to conceal bloodshot eyes
- breathe mint droppers and eye drop containers to conceal LSD and GHB
- wearing sunglasses at inappropriate times

**Behaviors Suggestive of Drug Use**
People’s behaviors and personalities change when things are happening in their lives, if someone is going thru a divorce or breakup, a child is ill, a family member passes away, they lose their job, etc. Supervisors and employers need to be able to determine if it is a personal issue, a bad day or possible substance abuse. The same goes for your children. Is your child just having a bad day at school, or fighting with a friend, or is something else going on? When you notice behavioral changes in your child, you want to be able to identify if it is adolescent stress or typical growing pains or is it something else like drug use. When you are trying to figure out what your child has been up to it is important to use and trust your senses.

**What do you see?** Look at the person. Are their eyes red and having problems focusing? They may have been drinking. Are their pupils dilated or constricted? Are they agitated? Are they breathing normal? Is there a strange burn on their mouth or fingers? That could signify smoking something through a metal or glass pipe, or they are huffing Dust Off. Have they developed nosebleeds? This can be indicative of cocaine use. Are they wearing long sleeves even in the middle of summer? This is a way to hide track marks from intravenous drug use.

**What do you smell?** Marijuana, cigarettes, Inhalants (chemical odor), and alcohol all have tell tales odors. Whether you notice the odor on the breath or clothes, it is a reason to be alarmed; for teens, simply being around others who
drink or smoke makes it more likely your child will try it. Do not be afraid to follow your nose. Excessive “pleasant” smells, like breath mints, heavy perfumes, laundered clothing (for a child who never does their own wash) can be tell-tale signs of them trying to cover up or mask odors. If you have teenagers, make sure you look in, and smell, their car – the smell of stale beer and marijuana can linger in the upholstery.

**What do you hear?** Listen to the clues the person is giving you by the things being said, the things they laugh at or the fact they may not be saying anything at all. Silence can speak volumes about something going on in the person’s life. By listening, over time you will be able to identify which behaviors are the results of bad days, mood swings or something more serious. Are they slurring their words? Are they speaking low and raspy or high pitched and fast? Are they able to follow the conversation? Are they taking a long time to answer? By using all your senses along with your gut instinct, you will be able to determine certain behavior as typical or indicative of drug use.

**Other signs that may suggest drug use:**
- Stories don’t add up and social circles change
- Schoolwork goes downhill
- Increased lying and stealing
- Change in daily habits including grooming, dress, activities, sleep patterns
- Change in friends

From a health care provider perspective, either prehospital (EMS) or in-hospital, we need to be aware of any signs and symptoms that may suggest illicit drug use and/or abuse that causes an individual to seek medical help. Being aware of those drugs commonly being used and abused are key to understanding how a potential patient may present to you.

Please review the attached Aurora Health Care South Market EMS Protocol on caring for patients suspected of drug overdose/ingestion. In addition to our drug protocol, one should also be aware of additional protocols (as below) that may need to be utilized for these patients including:
- A-28 Sedation
- A-29 Patient Restraint
- M-3 Unconscious – Unknown Etiology
- M-4 Seizures
- M-5 Hypertension
- M-8 Nausea and Vomiting
- M-17 Psychological Emergencies
- T-5 Glasgow Coma Scale/GCS
## Drug Overdose / Poisoning

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>Drug Overdose / Poisoning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FR B V I P</strong></td>
<td>General Approach:</td>
</tr>
<tr>
<td></td>
<td>1. <strong>Initial Medical Care – Special Considerations:</strong></td>
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<tr>
<td></td>
<td>- Follow established hazmat protocols. Do not enter contaminated scenes without appropriate PPE.</td>
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<td></td>
<td>- Anticipate the possibility of respiratory distress, seizure activity, dysrhythmias or vomiting.</td>
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<tr>
<td><strong>B V I P</strong></td>
<td>- Place an advanced airway, if airway compromised, and no response to Narcan.</td>
</tr>
<tr>
<td><strong>B V I P</strong></td>
<td>- Oxygen – titrate oxygen saturations to 94% or higher.</td>
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<tr>
<td><strong>V I P</strong></td>
<td>- Large bore IV.</td>
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<tr>
<td><strong>B V I P</strong></td>
<td>- Do NOT induce vomiting</td>
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<tr>
<td></td>
<td>- Obtain and record blood glucose level. If &lt; 60 treat per Protocol.</td>
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<tr>
<td></td>
<td>- If Seizures occur, treat per protocols.</td>
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<tr>
<td></td>
<td>- Be alert to and ask about suicidal ideation/attempt.</td>
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<tr>
<td><strong>V I P</strong></td>
<td>2. <strong>If patient is stable, in most cases no further treatment is required, transport.</strong></td>
</tr>
<tr>
<td><strong>V I P</strong></td>
<td>3. <strong>Narcotic or Synthetic Narcotic Overdose or unknown:</strong></td>
</tr>
<tr>
<td><strong>V I P</strong></td>
<td>- If weight is over 20 kg: Narcan 2 mg IV/IN/IO/IM</td>
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<tr>
<td><strong>V I P</strong></td>
<td>- If weight is under 20 kg: Narcan 0.1 mg/kg IV/IN/IO/IM</td>
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<tr>
<td></td>
<td>- Consider restraints before Narcan is administered.</td>
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<tr>
<td><strong>P</strong></td>
<td>4. <strong>Tricyclic Antidepressant Overdose</strong></td>
</tr>
<tr>
<td></td>
<td>- Sodium Bicarbonate 1 mEq/kg IV/IO for hypotension, deterioration of sensorium, dysrhythmias, or PEA.</td>
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<tr>
<td></td>
<td>- If seizures occur: Follow Seizure protocol.</td>
</tr>
<tr>
<td><strong>I P</strong></td>
<td>4. <strong>Organophosphate Poisoning</strong></td>
</tr>
<tr>
<td><strong>I P</strong></td>
<td>- If unstable patient:</td>
</tr>
<tr>
<td><strong>I P</strong></td>
<td>- Atropine 2 mg rapid IV/IO. Repeat every 3 minutes until signs of Atropinization appear (dry mouth, dried secretions, flushed skin). Usual Atropine dose limitation does not apply.</td>
</tr>
<tr>
<td><strong>I P</strong></td>
<td>- Mark 1 Kit</td>
</tr>
</tbody>
</table>
### Drug Overdose / Poisoning

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Mild/Moderate Symptoms¹</th>
<th>Severe Symptoms³</th>
<th>Other Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (0 - 2 yrs)</td>
<td>Atropine: 0.05 mg/kg IM; 2-PAM Cl: 15 mg/kg IM</td>
<td>Atropine: 0.1 mg/kg IM; 2-PAM Cl: 25 mg/kg IM</td>
<td></td>
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<tr>
<td>Child (2 - 10 yrs)</td>
<td>Atropine: 1 mg IM; 2-PAM Cl: 15 mg/kg IM</td>
<td>Atropine: 2 mg IM; 2-PAM Cl: 25 mg/kg IM</td>
<td></td>
</tr>
<tr>
<td>Adolescent (&gt;10 yrs)</td>
<td>Atropine: 2 mg IM; 2-PAM Cl: 15 mg/kg IM</td>
<td>Atropine: 4 mg IM; 2-PAM Cl: 25 mg/kg IM</td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>Atropine: 2 to 4 mg IM; 2-PAM Cl: 600 mg IM</td>
<td>Atropine: 6 mg IM; 2-PAM Cl: 1800 mg IM</td>
<td></td>
</tr>
<tr>
<td>Elderly, frail</td>
<td>Atropine: 1 mg IM; 2-PAM Cl: 10 mg/kg IM</td>
<td>Atropine: 2 to 4 mg IM; 2-PAM Cl: 25 mg/kg IM</td>
<td>Assisted ventilation should be started after administration of antidotes for severe exposures. Repeat atropine (2 mg IM or 1 mg IM for infants) at 5 - 10 minute intervals until secretions have diminished and breathing is comfortable or airway resistance has returned to near normal. Benzodiazepine for convulsions: See Protocol - Seizures</td>
</tr>
</tbody>
</table>

1. **2-PAMCl solution needs to be prepared** from the ampule containing 1 gram of desiccated 2-PAMCl: inject 3 ml of saline, 5% distilled or sterile water into ampule and shake well. Resulting solution is 3.3 ml of 300 mg/ml.
2. **Mild/Moderate symptoms** include localized sweating, muscle fasciculation’s, nausea, vomiting, weakness, and dyspnea.
3. **Severe symptoms** include unconsciousness, convulsions, apnea, flaccid paralysis.
### Drug Overdose / Poisoning

#### Beta Blocker or Calcium Channel Blocker Overdose

**If unstable patient**

- Patients can have varying degrees of hypotension, bradycardia (heart blocks), and lethargy and coma.
- Patients may decompensate quickly, so be prepared.
- Hypotension should initially be treated with a fluid challenge.

#### Calcium Channel Blockers

1. Normal Saline Bolus 500 to 1000 ml.
2. Calcium Chloride 5 ml to 10 cc IV/IO
3. Glucagon 2-5 mg IV/IO  
   Anticipate nausea, bradycardia or hypotension – be prepared to give anti-emetic medications

**If refractory, consider:**

4. Dopamine infusion 5-20 mcg/min IV/IO.
5. Repeat Calcium Chloride 5 - 10 ml IV/IO.
6. Consider transcutaneous pacing

#### Beta Blocker

7. Normal Saline bolus 500 – 1000 ml
8. Glucagon 2–5 mg IV/IO  
   Anticipate nausea, bradycardia or hypotension – be prepared to give anti-emetic medications  

**If refractory consider:**

9. Dopamine 5–20 mcg/min IV/IO, for SBP <90
10. Calcium Chloride 5–20 ml IV/IO if remains refractory
11. Consider transcutaneous pacing.

### CYANIDE POISONING

- Initial Medical Care.
- If hypotensive or pulseless: IV wide open. Expeditious transport. CPR as indicated. Use bag valve mask with 100% oxygen.
- If available, Hydro Cobalamin (Cyanokit) up to 5 gm IV/IO. Infuse over 15 minutes.
# COCAINE OVERDOSE

- If stable, supraventricular arrhythmias and PVCs are usually transient and require no immediate therapy.

## If unstable patient:

1. Treat dysrhythmias, chest pain, and hypertensive crisis per appropriate SOP.

## Special Considerations:

**A. Cocaine Induced Dysrhythmias:**

1. Persistent supraventricular dysrhythmias (PSVT, A. Fib, A. Flutter) or ventricular ectopy: *Ativan 2 mg IV* slowly (over 5-10 min) if not contraindicated.

2. VT with hemodynamically stable vitals: *Ativan 2 mg IV* slowly (over 5-10 min) if not contraindicated

**B. Cocaine Induced Hypertension and Pulmonary Edema:**

1. Initially treat with *Ativan 2 mg IV* slowly if not contraindicated

2. Nitroglycerin is preferred first line drug especially if chest pain present for Hypertension

3. *Labetalol 20 mg IVP* slowly would be second line choice

**C. Cocaine Induced Chest Pain and/or MI:**

1. Initially treat with *Ativan 2 mg IV* slowly if not contraindicated


2. If seizures occur: **Follow seizure protocol.**
CARBON MONOXIDE POISONING.
The most common symptoms of CO poisoning are headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. High levels of CO inhalation can cause loss of consciousness and death. Unless suspected, CO poisoning can be difficult to diagnose because the symptoms mimic other illnesses.

In structure, plastics or chemical fires, also consider Cyanide toxicity.

The following protocol should be initiated for any of the following:
- Carbon Monoxide exposure with symptoms
- Carbon Monoxide exposure and pregnant
- If patient's Blood Carbon Monoxide level is greater than 12% without symptoms on monitoring device.

A. Remove from area of carbon monoxide exposure
B. Begin oxygen therapy with high flow oxygen (as close to 100% oxygen as available). Pulse Oximetry is not an accurate indicator in the presence of CO. High flow Oxygen is indicated even in the presence of 100% SPO2 readings.
C. If available, Monitor the ECG.
D. The following are criteria for possible hyperbaric oxygen therapy:
   - Severe symptoms. Signs and symptoms of Severe CO exposure include: history of loss of consciousness, lethargy, confusion, disorientation, seizures, focal neurological deficits, ischemic chest pain, new dysrhythmias, 12 lead ECG changes, and hypotension.
   - CO greater than 30%
   - Pregnant and has a CO level greater than 15%
   Contact medical control to consider transport directly to a hospital capable of hyperbaric oxygen therapy.
E. If not a candidate for hyperbaric oxygen therapy, transport to closest appropriate emergency department.