

DRUG INFLUENCE SIGNS AND SYMPTOMS

	CNS DEPRESSANTS	INHALANTS	PCP	CANNABIS	CNS STIMULANTS	HALLUCINOGENS	NARCOTIC ANALGESICS
HORIZONTAL GAZE	PRESENT	PRESENT	PRESENT	NOT PRESENT	NOT PRESENT	NOT PRESENT	NOT PRESENT
NYSTAGMUS VERTICAL	POSSIBLY PRESENT	POSSIBLY PRESENT	USUALLY PRESENT	NOT PRESENT	NOT PRESENT	NOT PRESENT	NOT PRESENT
NYSTAGMUS LACK OF CONVERGENCE	PRESENT	PRESENT	PRESENT	PRESENT	NOT PRESENT	NOT PRESENT	NOT PRESENT
PUPIL SIZE	WITHIN NORMAL RANGE SLOWED	NORMAL RANGE OR DILATED SLOWED	WITHIN NORMAL RANGE NORMAL	DILATED BUT MAY BE NORMAL NORMAL	DILATED SLOWED	DILATED NORMAL	CONSTRUCTED LITTLE OR NO VISIBLE REACTION BELOW NORMAL
REACTION TO LIGHT	BELOW NORMAL	ABOVE NORMAL	ABOVE NORMAL	ABOVE NORMAL	ABOVE NORMAL	ABOVE NORMAL	BELOW NORMAL
PULSE RATE	BELOW NORMAL	DEPENDS ON SUBSTANCE	ABOVE NORMAL	ABOVE NORMAL	ABOVE NORMAL	ABOVE NORMAL	BELOW NORMAL
BLOOD PRESSURE	WITHIN NORMAL RANGE	ABOVE, BELOW OR NORMAL	ABOVE NORMAL	WITHIN NORMAL RANGE	ABOVE NORMAL	ABOVE NORMAL	BELOW NORMAL
BODY TEMPERATURE	Uncoordinated Disoriented Sluggish Thick, slurred speech Drunk-like behavior Gait ataxia Drowsiness Droopy Eyes Fumbling	Residue of substance around nose & mouth Odor of substance Possible nausea Slurred speech Disorientation Confusion Bloodshot, watery eyes Lack of muscle control Flushed face Non-communicative Intense headaches	Perspiring Warm to the touch Blank stare Very early angle of HGN onset Difficulty in speech Incomplete verbal responses Repetitive speech Increased pain threshold Cyclic behavior Confused agitated Hallucinations Possibly violent & combative Chemical odor "Moon walking"	Marked reddening of conjunctiva Odor of marijuana Marijuana debris in mouth Body tremors Relaxed inhibitions Increased appetite Impaired perception of time & distance Disorientation Possible paranoia	Restlessness Body tremors Excited Euphoric Talkative Exaggerated reflexes Anxiety Grinding teeth (bruxism) Redness to nasal area Runny nose Loss of appetite Insomnia Increased alertness Dry mouth Irritability	Dazed appearance Body tremors Synesthesia Hallucinations Paranoia Uncoordinated Nausea Difficulty in speech Perspiring Poor perception of time & distance Memory loss Disorientation Flashbacks	Droopy eyelids ("ptosis") "On the nod" Drowsiness Depressed reflexes Low, raspy, slow speech Dry mouth Facial itching Euphoria Fresh puncture marks Nausea Track marks
GENERAL INDICATORS	*Note: With Methaqualone, pulse will be elevated and body tremors will be evident. Alcohol and Quaaludes elevate pulse. Soma and Quaaludes dilate pupils.	**Note: Anesthetic gases cause below normal blood pressure; volatile solvents and aerosols cause above normal blood pressure.				Note: Tolerant users exhibit relatively little psychomotor impairment	

B. DRE Drug Categorization: Based on Patterns of Signs and Symptoms

Drug Recognition Experts (DRE) classify the drugs of abuse into seven categories. This categorization system is based on the premise that each drug within a category produces a pattern of effects, known as signs and symptoms. This DRE categorization system is analogous to a handwritten signature, rather than a fingerprint. Each time a signature is written, it will be slightly different. The signature will still be recognizable as identifying a specific individual. Fingerprints, on the other hand, do not change.

Practically, this means that although there are numerous drugs within each of the seven categories, the overall pattern of effects within the category at hand is the same. The effects can and do vary from drug to drug, primarily in terms of intensity and duration of action.

The effects of a drug depend not only upon the substance itself, but the subject (or suspect), as well as the setting. The "3-Ss" of substance, suspect, and setting interact to produce the observable effects. Generally, the effects of a drug are dose-dependent. More of the substance, such as alcohol, will generally produce more pronounced effects. The effects also depend on how the drug was administered, its purity, and the presence of other drugs. The suspect's tolerance to the substance, the user's expectations, coexisting illness and fatigue all effect the outcome. Also, for many reasons, individuals vary in their response to the same drug. For example, people differ in metabolic rates. The effects of a drug also vary in the same individual. Indeed, rarely will a single individual experience or display all the effects associated with a drug. The setting or the environment interacts with the substance and the suspect to produce the constellation of effects. "White coat hypertension" is an example of the interaction of environment and physiology. The fact that one is having his or her blood pressure taken in a doctor's office may temporarily raise the person's blood pressure.

Drug abusers use drugs for effects on the Central Nervous System (CNS), primarily the brain. If a drug does not affect the brain, then it will not be abused (although, of course, it may

be misused).²⁶ The seven DRE drug categories are:

1. **CNS Depressants (including alcohol)**
2. **Inhalants**
3. **Phencyclidine**
4. **Cannabis**
5. **CNS Stimulants**
6. **Hallucinogens**
7. **Narcotic Analgesics.**

²⁶Misuse refers to an inappropriate use of a drug. For example, taking an antibiotic for a viral infection is misuse. Abuse refers to the use of a substance for psychoactive (mind altering) effects.

The Drugs of Abuse: An Overview

1. Central Nervous System Depressants

This category includes the most widely abused drug, alcohol. In addition, the category consists of barbiturates, non-barbiturates that have barbiturate-like effects, anti-anxiety tranquilizers, anti-psychotic tranquilizers, certain anti-depressants, and certain pharmaceutical combinations that contain more than one type of CNS Depressant. The benzodiazepines²⁷, chloral hydrate, GHB,²⁸ methaqualone (Mandrax), lithium, phenobarbital, the sedating antihistamines, and many other substances are included in this category. Commonly referred to as "downers," and also as sedative-hypnotics, the effects of these drugs at intoxicating doses mirror the effects of alcohol. Importantly, however, they are not detected by an alcohol breath test, and do not produce an odor of an alcoholic beverage. Unlike the case with alcohol, there are generally no consistent correlations between the levels of these drugs ingested and the degree of intoxication. These drugs produce relaxation, drowsiness, impaired balance and coordination, slurred speech, a lowering of inhibitions, and increased risk taking. They also produce horizontal gaze nystagmus, do not generally affect pupil size, and typically depress the vital signs. The non-alcohol CNS Depressants are extremely dangerous when taken with alcohol. Pharmaceutical preparations of these drugs usually contain warnings advising the user not to drink alcohol at the same time, and to be aware that the drugs may impair driving.

2. Inhalants

The drugs in this category are usually inhaled. Three sub-categories comprise the inhalants: volatile solvents, aerosols, and anesthetic gases. The typical user of these drugs is young, and as a result, does not have ready access to more preferred drugs. Included are

²⁷Benzodiazepines are anti-anxiety tranquilizers that share a similar chemical structure. Examples include: Valium (diazepam), Librium, Xanax, Halcion, flunitrazepam ("roofies" or Rohypnol), Klonopin (clonazepam) and many others.

²⁸Gammahydroxy butyrate

solvents, such as paint thinner, gasoline, toluene, turpentine, and paint. Nitrous oxide ("laughing gas"), freon, ether, and many other substances are also included. Common indicators of the use of these drugs are the presence of chemical odors on the user, and residue of the substance on the user's face, clothing, and hands. Intoxicated individuals may look and act similar to one under the influence of alcohol. They may display impaired gait, slurred speech, bloodshot eyes, and a blank stare. Since these substances displace oxygen, the heart generally will accelerate, resulting in an increased pulse rate. Depending on the specific substance, blood pressure can be elevated or depressed.²⁹ As with the CNS Depressants, these drugs generally produce horizontal gaze nystagmus, but do not usually affect pupil size.

3. Phencyclidine (PCP)

This drug is usually known as PCP, which represents its longer chemical name of phenylcyclohexyl piperidine. It is also commonly called phencyclidine. Although frequently classified as a hallucinogen, and sometimes as a depressant, a stimulant, or an analgesic, PCP is appropriately termed a dissociative anesthetic. The drug ketamine³⁰, which has uses in veterinary medicine, in pediatric surgery, and in other areas, is included in this category, as are chemical analogs of PCP.

The typical effects of PCP are elevated vital signs, accompanied by both horizontal and vertical gaze nystagmus. In addition, rigid skeletal muscles, a blank stare, an absence of pain, hallucinations, and many other effects may be evident. PCP users may become suddenly violent, and pose an extreme danger to police officers. Many non-lethal control devices, such as "taser"³¹ dart guns, have been developed in order to subdue the PCP user.

²⁹ The anesthetic gases cause blood vessels to enlarge or dilate. This may cause a drop in blood pressure.

³⁰ Ketamine is used legitimately only in an injectable form. The Physician's Desk Reference (PDR) includes ketamine. Its effects are basically identical to that of PCP.

³¹ "Taser" is an acronym for Thomas A. Swift Electronic Rifle.

4. Cannabis

This category, which includes marijuana, hash, hash oil, and the synthetic drug dronabinol³², is the most widely abused illicit drug. Although it has a popular reputation as a relatively benign drug, it is extremely impairing, affecting judgment, depth perception, ability to maintain attention, as well as having effects on the cardiovascular system. Cannabis causes blood shot eyes, accelerated heart rate (tachycardia), muscle tremors, forgetfulness, and many other effects. Unlike the first three categories (CNS Depressants, Inhalants, and PCP), this category does not produce horizontal gaze nystagmus. Users of cannabis frequently use alcohol, as well as other drugs, at the same time.

5. Central Nervous System Stimulants

This category includes the ubiquitous cocaine in all its various forms, amphetamine, methamphetamine, ephedrine, Ritalin, certain diet pills, and other related substances. Commonly known as the "uppers," the effects of these drugs mimic the body's "fight or flight" response, the autonomic nervous system's response to perceived danger.³³ Their effects include dilated pupils, elevated vital signs, hyper-alertness, rapid and agitated body movements, extreme weight loss accompanied by deteriorating health and hygiene, and a diminished ability to "filter" environmental stimuli, such as noises and movement. CNS Stimulants do not produce horizontal gaze nystagmus. The user may overreact to seemingly minor events, and may view minor inconveniences as elaborate plots. As the effects wear off, the user may physiologically "crash," and may appear nearly the opposite of when he or she was under the influence of the drug. The user may then sleep for long periods, may wake voraciously hungry, and may be extremely

³²Dronabinol's brand name is Marinol. Listed in the Physician's Desk Reference, it is a U.S. Drug Enforcement Administration Schedule II drug. Its uses include combating nausea induced by cancer chemotherapy. Dronabinol is synthetic tetrahydrocannabinol, the psychoactive component of marijuana.

³³These substances are sometimes called sympathomimetics and adrenomimetics. This means that they mimic the naturally occurring and appropriate response of the body to danger.

dysphoric.

6. Hallucinogens

Hallucinogens are used for their distorted sensory perceptions known as hallucinations. In many respects, they are closely related to the CNS Stimulants, as is evidenced by the fact that they also cause dilated pupils and elevated vital signs, and do not produce horizontal gaze nystagmus. The user may experience a mixing of the senses, called synesthesia, in which the user may "hear" visual stimuli, such as colors, and may "see" sounds, such as music. LSD, psilocybin, mescaline, peyote, bufotenine, morning glory seeds, jimson weed, nutmeg and the psychedelic amphetamines are some of the drugs in this category. The psychedelic amphetamines include MDMA, or methylenedioxy methamphetamine, which is known in the vernacular as "Ecstasy," and many other related preparations. Very popular in the 1960s, these drugs have experienced a resurgence of use in the 1990s.

7. Narcotic Analgesics

This final category includes the opiates, such as morphine, codeine, percodan, heroin, meperidine, methadone, fentanyl, and numerous others.³⁴ These drugs relieve pain, but also produce sedation. The specific effects include constricted pupils, depressed vital signs, slow and deliberate movements, and forgetfulness. These drugs do not produce horizontal gaze nystagmus. Although these drugs are frequently injected, more users, because of concern over the spread of infectious disease through the sharing of hypodermic needles, are insufflating (intranasal administration) and inhaling drugs such as heroin.³⁵ These drugs are known for their physically addictive qualities, as well as for the extremely unpleasant, though not life-

³⁴ The term "opioid" is often applied to this category. This means that the effects are similar to opium, although the substance may not contain any actual opium.

³⁵ The National Institute of Drug Abuse and the National Institutes of Health sponsored the Heroin Use and Addiction: A National Conference on Prevention, Treatment, and Research, in Washington, DC in September of 1997. Researchers reported that the potency of street heroin has increased substantially, thus making insufflating (snorting) heroin more attractive and risky.

threatening, withdrawal syndrome.

8. Poly-drug Use

Poly-drug use is the norm for today's drug user. Poly-drug use, also termed poly-pharmacy and multi-habitation, simply means that the drug user is using more than one category of drugs simultaneously or serially. Often, the drugs have nearly opposite effects. For example, an extremely common drug combination in many parts of the United States is the "speed ball." This slang term refers to combining a CNS stimulant, usually cocaine, with a narcotic analgesic, typically heroin. In many respects, these drugs have opposite effects. For example, cocaine dilates the pupils and elevates the vital signs, whereas heroin constricts the pupils and depresses the vitals. Contrary to what defense attorneys attempt to coax the DRE to say, neither drug "cures" the effects of the other. What typically occurs is that the user displays a mixture of signs and symptoms, such as dilated pupils with depressed vitals, which can best be explained by poly-drug use.

DREs apply four concepts to interpret poly-drug signs and symptoms: additive, antagonistic, overlapping, and null.

"Additive" means that each of the drugs used produce the same effect. Each of the drugs reinforces a specific effect of the other. For example, CNS stimulants and cannabis independently elevate pulse rate. Taken together, the user's pulse will be elevated, probably to a greater degree than either drug would separately. Each drug is reinforcing an effect of the other.

"Antagonistic" means that each of the drugs produces an opposite effect. Cocaine dilates the pupils, while heroin constricts them. When taken together, the user's pupils may be dilated, may be constricted, or may be within the normal range (3.0 mm to 6.5 mm diameter). The effects displayed are dependent on the dose of each of the drugs, the user's tolerance to each of the drugs, and importantly, the point in time that the user is evaluated by the DRE. Cocaine, a short-acting drug, may "wear off" quickly, and the effects of the heroin may then dominate.

An "overlapping" effect refers to the case in which one of the drugs produces the effect, but the other drug is neither additive nor antagonistic to it. For example, alcohol produces horizontal gaze nystagmus. If alcohol is taken with cocaine, a drug that does not cause horizontal gaze nystagmus, the user will display nystagmus - again, due to the alcohol.

"Null" effect refers to a combination of drugs in which neither of the drugs used produces the effect. For example, cocaine does not produce horizontal gaze nystagmus; neither does heroin. Taken together, the user will not have nystagmus since neither of the drugs produces nystagmus. To adapt an old rock 'n roll song, "Nothin' and nothin' means nothin'."³⁶

³⁶ In 1974 A&M Records released "Nothing from Nothing," which was recorded by Billy Preston; written by Billy Preston and B. Fisher. The verse in the song is "Nothin' from Nothin' leaves Nothin'." Thanks to Mark George for this information.