

Cocaine Drug Information

Classification

Cocaine (benzoylecgonine) is a central nervous system stimulant derived from the leaves of the coca plant. Cocaine has two major pharmacological actions; one is a local anesthetic, and the other is an indirect acting sympathomimetic having many of the properties of an amphetamine. The drug is either in the salt/powder form (cocaine HCL) which can be administered by snorting or intravenous injection or in the free base "crack" form which is smoked.

Metabolism

After smoking, cocaine is rapidly absorbed with peak plasma concentrations occurring at about 5 minutes, versus 30-40 minutes following intranasal ingestion. Cocaine is extensively metabolized by the liver and blood enzymes with approximately one percent of the dose excreted in the urine unchanged. The major metabolite found in the urine is benzoylecgonine (25-40% of the dose), followed by ecgonine methyl ester (18-22%). Depending upon the dosage ingested, frequency of use, and metabolic variation, benzoylecgonine can remain detectable in the urine for as long as 48-96 hours post ingestion.

Abuse

Cocaine produces a short-lived, intense high which is extremely addictive. The signs and symptoms associated with the abuse of cocaine depend upon the amount used and the duration of use. With infrequent or low dose use a person may experience euphoria, lowered anxiety, talkativeness, decreased appetite, increased sexual arousal, increased alertness, and decreased fatigue. Physiologically there can be increased heart rate and blood pressure.

With increased dose or prolonged abuse (either binge or chronic) an individual may experience a set of secondary effects that can include increased anxiety, irritability, aggressiveness, paranoia and hypersexuality. Physiological effects can include dilated pupils, dry mouth, hippus, increased body temperature and tachycardia. In overdose situations, a person may experience hallucinations, coma or death. Crash symptoms typically follow binge abuse of cocaine. This phase is marked by extreme fatigue, depression, mental exhaustion and prolonged periods of sleep.

Laboratory drug testing: Methods of Analysis

Enzyme immunoassay (EIA) is a widely used screening method designed to specifically detect benzoylecgonine and to a lesser extent, cocaine and ecgonine methyl ester (secondary cocaine metabolite). Commonly used confirmation methods include gas chromatography/mass spectrometry (GC/MS) and liquid chromatography/tandem mass spectrometry (LC/MS/MS). These methods offer excellent sensitivity and specificity and are the methods of choice for the confirmation of the immunoassay positive screens.