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INFORMATION FOR PROFESSIONALS

Cocaine

Introduction

Cocaine is a powerful nervous system stimulant. Like amphetamines (speed) and other stimulant drugs, cocaine increases alertness, decreases appetite and the need for sleep, and produces intense feelings of euphoria and well-being. It is prepared from the leaves of the coca bush, a shrub that grows primarily in the Andes Mountains of Bolivia and Peru. Crack and freebase are potent forms of cocaine that can be smoked.

Native cultures in South America traditionally used cocaine (by chewing the coca leaves) to counteract fatigue from living at high altitudes. In the 1860s, a method was discovered in Germany for producing pure cocaine powder (cocaine hydrochloride) from an extract of the coca leaf, and by the late 1800s, use of cocaine was widespread in the West. Cocaine was used for its tonic properties as an ingredient in patent medicines and other beverages, such as Coca-Cola® (the manufacturers stopped adding cocaine to Coca-Cola in 1903) and cocaine wines. A number of 19th century scientists and researchers, including Sigmund Freud, believed that refined cocaine held great promise both as an anesthetic and as a treatment for a variety of mental and physical disorders. However, the initial enthusiasm on the part of Freud and other researchers subsided after it was discovered that cocaine had significant addictive properties.

The only currently accepted medical use for cocaine is as a surface anesthetic in ear, nose, and throat surgery. Cocaine continues to be one of the more commonly used "street" drugs. It is of special concern because it is a very toxic drug that many users erroneously assume is safe and non-addicting. In fact, cocaine use produces strong psychological dependence and carries a high risk of severe adverse reactions.

Cocaine preparations

("coke," "C," "snow," "flake," "blow," "crack," "rock," "freebase," "speedball" consisting of cocaine and heroin)

Cocaine is usually available as cocaine hydrochloride salt, a white powder. It is either snorted directly into the nose or dissolved in water and injected, which causes a more rapid and intense high. When sold on the street, it is often "cut," or diluted with similar-looking substances such as cornstarch, talcum powder, dextrose, or baby laxatives; with local anesthetics such as procaine and benzocaine; or with other stimulants such as amphetamines. Freebase is cocaine base with the hydrochloride removed. It is prepared by heating a cocaine hydrochloride and alkaline solution with organic solvents. A danger in preparing freebase is that the solvents are very flammable and explosions can result.

Crack is made by heating cocaine hydrochloride with baking soda. The mixture forms a solid chunk composed of chemicals that include freebase cocaine. It is typically divided into small amounts (between 0.3 and 0.5 g) and sold for $30–$40.

Drug effects

The effect of any drug depends on the specific drug, the amount, how it is taken, what the person expects, previous exposure of the body to this and other drugs, the setting or location, the user's mental state and other drugs being used. A common pattern among users in social settings involves sniffing ("snorting") into each nostril 20 to 30 mg of cocaine powder that has been finely chopped with a razor blade and arranged into "lines": thin strips about 0.3 cm wide and 2.5 cm long. This amount may be repeated two or three times an hour over several hours.

Usual oral doses range from 100 to 200 mg, intravenous doses from 25 to 200 mg, and smoked doses from 250 to 1000 mg. Very heavy users may sniff or smoke up to 10 g (10,000 mg) per day.

Effects of short-term use

Cocaine potentiates the actions of neurotransmitters (dopamine, norepinephrine, and serotonin) in the brain, producing a marked psychomotor stimulant effect. Peripheral effects of sympathetic nerve activity are also potentiated.

Effects of cocaine include an intense feeling of euphoria and well-being. Other desired effects can include alertness, decreased appetite and need for sleep, and a feeling of enhanced energy. Some users report feeling contemplative and rapturous. Larger doses may intensify the "high."

Less desired effects can also occur, particularly at higher doses. These include severe agitation, violent behavior, paranoid thoughts, delirium,

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and fainting. The physical effects of cocaine use include rapid heart rate and breathing, and increased blood pressure and temperature. Undesirable physical effects more common with larger doses include nausea, vomiting, chest pain, tremors, seizures, and abnormal heart rhythms.

The effects of cocaine appear soon after a single dose and disappear within a few minutes or hours. Injecting produces a more faster and more intense effect than snorting; smoking crack and freebase produces an even faster effect. The duration of action of cocaine is much shorter than that of amphetamine. The half-life of cocaine in plasma is about 50 minutes, but crack users typically desire more cocaine after 10 to 30 minutes. Typically, users will take a number of doses over a period of several hours. Heavy users go on binges or sprees lasting hours or even days, often until their drug supply is gone. Some users take depressant drugs like alcohol, tranquillizers or heroin to modify cocaine's effects, and to stop binges. When users stop taking cocaine, they often feel depressed, anxious and agitated.

Fatal effects

Respiratory arrest is a common cause of death from cocaine overdose. It is more likely to occur if a depressant drug such as heroin has also been taken. Death can also result from events as varied as abnormal rhythms of the heart, ruptured blood vessels, very high body temperature, and gangrene of the intestine.

Although most deaths have followed intravenous injection, they have also occurred after smoking, snorting, or oral use. The lethal dose of cocaine is not known, but is probably quite variable. Death has resulted from doses as low as 30 mg snorted and 20 mg injected, yet users have survived doses of several grams (several thousand milligrams). Virtually no dose, no matter how small, can be guaranteed safe. Impurities in street cocaine can also produce fatal allergic reactions.

Effects of long-term use

Headaches and seizures are common complications of cocaine use. Studies have indicated that chronic, heavy cocaine use probably causes some brain damage, but the extent of damage and the amount of impairment is not known. Restricted blood flow to the brain may account for reports of lasting problems with attention, memory and mental flexibility (the ability to shift from one task demand to another). Some long-term cocaine abusers display disinhibition, or trouble inhibiting inappropriate behaviours. Ironically, while depression is a major symptom of cocaine withdrawal, some users take cocaine to treat pre-existing depression.

Regular cocaine users are often restless, extremely excitable, suspicious or paranoid. They may suffer from insomnia, and eventually may experience hallucinations and delusions. This condition is similar to amphetamine psychosis and paranoid schizophrenia.

In addition to the physical effects seen with shortterm use, heavy use can cause mood swings, weight loss, constipation, impotence and difficulty urinating.

Chronic use of cocaine can cause heart attacks, strokes, abnormal heart rhythms, and other heart muscle abnormalities. Thus, cocaine should be viewed as a direct cardiotoxin. Strokes can occur in young people and first-time users as well as chronic abusers.

Cocaine also depresses the immune system, which may result in users having more infections. In addition, cocaine use can cause allergic reactions, serious stomach and intestinal complications, liver damage, and muscle wasting.

Chronic cocaine sniffing can cause stuffy, runny and bloody noses, and perforation of the nasal septum that divides the two nasal passages. Smoking cocaine damages the lungs and throat. Heavy smokers may cough up blood or black phlegm. Additionally, users who inject cocaine and share needles risk getting hepatitis and HIV, the virus that causes AIDS. Sexually transmitted diseases, including syphilis and HIV, can also be spread during the exchange of sex for drugs.

People who frequently use mood-altering drugs like cocaine can develop serious personal problems. Using drugs can become more important than family and friends. Users may continue using even when their job or schoolwork is suffering, or when they experience financial, legal or spiritual problems. Young people who use drugs heavily can miss valuable opportunities for learning to solve problems, handle their emotions and become mature, responsible adults.

Cocaine and pregnancy

Cocaine use increases complications during pregnancy, such as spontaneous abortions and premature birth. Newborns who were exposed to cocaine in the womb may have reduced weight and head size, blocked blood vessels in the brain, and other physical problems consistent with fetal malformations. They are often irritable, have sleep and feeding problems, and may suffer lasting developmental problems.

Cocaine is also excreted into milk. Consequently, infants breastfed by cocaine-using mothers can experience increased heart rate, rapid breathing, extreme irritability, and seizures.

Tolerance and dependence

Cocaine is considered by many to be one of the most addictive of all drugs of abuse. However, instant addiction to cocaine does not occur. Recent studies have shown that the majority of people who try cocaine never become addicted. Users who progress from intranasal use to smoking or injecting run a much greater risk of becoming addicted. For those who become addicted, cocaine is a particularly difficult drug to stop using. Intense craving for the drug occurs for many months, and frequently leads to a return to drug use.

When smoked or injected, cocaine reaches the brain very rapidly and produces a brief but dramatic "rush" that is intensely pleasurable. It is followed, however, by an extreme low ("crash"). This sequence can generate an intense drive to use more drug, so the user can quite quickly progress from experimentation to dependence.

Chronic users develop tolerance to the euphoria and other physiological effects, and require larger doses to achieve the same effect. However, taking larger doses results in increased sensitivity to cocaine's adverse effects, including anxiety, depression, seizures and psychosis.

Withdrawal

Withdrawal from cocaine causes few physical effects, but the psychological effects, including loss of pleasure, depression and low energy, are severe. Three phases of withdrawal have been described. Phase one, the "crash," follows the end of the binge and lasts for up to four days. The user has very low energy and mood, may sleep for several days, and may eat large amounts of food.

During phase two, which lasts for two to 12 weeks, the user feels little initiative, intense boredom, and minimal pleasure from life. This limited existence, as compared with the memories of drug-induced euphoria, can lead to severe craving, resumption of cocaine use, and cycles of recurrent binges.

Phase three, "extinction," gradually follows if no drug is taken for many months. Normal function returns and eventually craving decreases, or at least is not associated with a relapse to drug use.

Who uses cocaine?

The increased use of cocaine during the 1960s was limited mostly to the affluent because of the high cost. Today, people from all walks of life use cocaine, but most use it only occasionally.

A 2002 survey of Alberta students (grades 7 to 12) found that 2.9 per cent had used cocaine and 2.8 per cent had used crack in the previous year. The prevalence of cocaine use was much less than that of cannabis use (28%) and alcohol use (56 per cent).

Among Canadian university students surveyed in 1998, 0.6 per cent reported using cocaine in the previous twelve months.

Among clients admitted to Alberta addiction treatment centres in 2003/2004, 35 per cent reported using cocaine in the previous year. Twenty-six per cent of clients reported cocaine as their drug of concern.

Cocaine and the law

Under Canada's Controlled Drugs and Substances Act, unlawful possession of cocaine is a criminal offence. For less serious charges tried by summary conviction, the penalty for a first offence is a fine of up to $1,000 and/or six months' imprisonment. For subsequent offences, the penalty is a fine of up to $2,000 and/or one year's imprisonment. The penalty for possession of cocaine is up to seven years' imprisonment when the charges are considered more serious and are tried by indictment. Producing, trafficking, importing and exporting cocaine are indictable offences punishable by up to life imprisonment.

ADDITIONAL READING:

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