

even convulsions — the latter being more prominent after large doses given intravenously, the common technique used by "street addicts." Abuse of this class of substances arises from and is perpetuated solely by the psychic drives to attain maximum euphoria. Physical dependence does not develop. Qualitatively, these psychologic effects are similar to those produced by cocaine. However, cocaine is a much more dangerous agent, and quantitative comparison would not be valid. In contrast to the amphetamines, cocaine is capable of inducing severe cytotoxic effects in nearly all tissues, including the brain.

A characteristic feature of the amphetamines is their capacity to produce tolerance. This property is possessed by only a few CNS stimulants. Although tolerance develops slowly, progressive increments in dosage permit ingestion of amounts hundreds of times greater than the original therapeutic dose. The daily ingestion of 1700 mg of amphetamine has been reported. For instance, progressive increase in dosage over many weeks permits the monkey to tolerate ten to twenty times the average lethal convulsive dose. It would appear that all the components of the brain do not become tolerant at the same rate. Thus, a user will experience increased nervousness and insomnia as the dose is increased. Ingestion of very large quantities may induce profound behavioral changes, often of a psychotoxic nature, including hallucinations and delusions. The latter effects are much more likely to occur following intravenous injection. Indeed, "addicts" take amphetamine by this route for the purpose of obtaining bizarre mental effects often associated with sexual fantasies, even orgasm.

Another characteristic feature of the amphetamines is that the cardiovascular system becomes tolerant to large doses rather rapidly so that the heart rate and blood pressure are not significantly increased in those who abuse amphetamines chronically.

Although amphetamines do not induce physical dependence as measured by the criterion of a characteristic and reproducible abstinence syndrome, it would be inaccurate to say that withdrawal of large doses is symptomless. The sudden removal of a stimulant drug which has masked chronic fatigue and the need for sleep permits these to appear in an exaggerated fashion. The