3. Symptoms of chronic alcohol use
   a. Damage to the liver
   b. Cardiac muscle damage
   c. Damage to circulatory, gastrointestinal, and genitourinary systems
   d. Brain damage. Wernicke-Korsakoff Syndrome describes the extreme end of the spectrum of cognitive impairment resulting from chronic alcohol abuse.
   e. Teratogenic effects. Fetal alcohol syndrome (FAS) is characterized by adverse CNS effects (microcephaly, developmental delay, mental retardation, and abnormal neuronal integration), growth retardation, and characteristic facial distortion (Blum, 1984; Gold, 1991).
   f. Accidental injuries due to impairment in cognition, visual-motor functioning, and judgment (Gold, 1991).

The dose-related effects of alcohol are well documented (Blum, 1984; Schuckit, 1995) and presented as follows:

1. Blood alcohol content of 0.0 to 19 (mg/100ml blood). Mild sedation and relaxation may be observed.
2. Blood alcohol content of 20/99 (mg/100ml blood). Impairment of motor coordination and diminished reaction time may be observed.
3. Blood alcohol content of 100/199 (mg/100ml blood). More severely impaired coordination, impairment of judgment, and decreased mental activity may be observed.
4. Blood alcohol content of 200/299 (mg/100ml blood). Slurred speech, marked incoordination, impaired judgment, and labile mood may be observed.
5. Blood alcohol content of 300/399 (mg/100ml blood). Anesthesia, memory impairment, labile mood, and loss of consciousness may be observed.
6. Blood alcohol content of 400 (mg/100ml blood) and higher. Respiratory failure, coma, or death may occur.

Barbiturates

Barbiturates are synthetic compounds prepared in pill form (Blum, 1984). This class of CNS depressants can be dissolved and injected. However, the most common route of administration is oral. A barbiturate is any derivative of barbituric acid. More than 2500 compounds have been synthesized, although only about a dozen are commonly used. Barbiturates have been used medically to reduce restlessness and tension and to induce sleep. They have also been used to treat epilepsy. Barbiturates (and other CNS depressants including alcohol) appear to produce their effects by altering the operation of the neurotransmitter GABA. They are usually classified by duration of action as follows (Blum, 1984):

1. Ultra short-acting barbiturates (duration of action from 15 min to 3 hr). These drugs are used as IV anesthetics and include drugs such as sodium methohexital (Brevital), sodium thianylal (Surital), and sodium thiopental (Pentothal).

Shorter-acting barbiturates produce the most intense intoxication and have the highest abuse potential.

2. Short- to intermediate-acting barbiturates (duration of action from 3 to 12 hr). These drugs are used as sedative-hypnotic agents and include such drugs as amobarbital (Amytal), sodium butabarbital (Butisal), sodium pentobarbital (Nembutal), and secobarbital (Seconal).

3. Long-acting barbiturates (duration of action from 12 to 24 hr). These drugs are used as sedative-hypnotic agents and include phenobarbital (Luminal).

Barbiturates are well absorbed from the stomach. Short-acting barbiturates are absorbed more rapidly than long-acting ones (Blum, 1984). Alcohol enhances absorption, thereby increasing medical risk. Barbiturates are metabolized by the liver and excreted via the kidneys.

Effects of Barbiturate Use

1. Acute pscyhological effects
   a. Relaxation
   b. Reduced tension
   c. Improved sleep

At higher levels:

   d. Cognitive impairment such as diminished concentration and problems with attention and memory
   e. Inappropriate sexual or aggressive behavior
   f. Mood lability
   g. Impaired motor behavior (e.g., slurred speech, incoordination)
   h. Impaired judgment
   i. Irritability

2. Toxic reaction
   a. Coma
   b. General shock syndrome (i.e., weak rapid pulse, decreased blood pressure, cold, sweaty skin)
   c. Death due to respiratory arrest, cardiovascular collapse or kidney failure

Barbiturates have often been used as a means of suicide.

Benzodiazepines

Benzodiazepines are CNS depressants and include such drugs as chlordiazepoxide (Librium), diazepam (Valium), chlorazepate (Tranxene), chlorazepam (Klonopin), alprazolam (Xanax), and lorazepam (Ativan). They are similar in properties to the barbiturates; however, they are much safer in terms of risk of overdose/toxicity. The benzodiazepines are used medically for treatment of anxiety conditions.

Cannabinoids

Cannabinoids come from the Indian hemp, a tall weedy herb that can be grown in any region with hot summers (Blum, 1984; Gold, 1986, 1991; McCaig & Lawson,