BARBITURATES AND OTHER DOWNERS

Introduction

The class of drugs that will discussed in detail in this booklet are generally called central nervous system (CNS) depressants. A CNS depressant is a drug that slows down, reduces the function of, or depresses the brain's function. The drug's effect is general throughout the whole brain's structure. This book will discuss three groups of drugs which fall into this class:

Barbiturates - such as Seconal, Amytal,
Nembutal, etc.
Nonbarbiturates - such as methaqualone
(Quaalude), chloral hydrate, etc.
Minor Tranquilizers - such as Valium, Librium,
Miltown, etc.
Other CNS depressants such as alcohol and marijuana (in low doses) are sufficiently important that they either have a whole program devoted to them or are covered in a separate module of the drug education program (Carroll, 1989, p. 11,180).
Another group of drugs which will be discussed briefly are called the major tranquilizers. They are depressants but they only act on a specific area of the brain. They include such drugs as Thorazine, Haldol, etc (Carroll, 1989, p. 11,12).

There will be a lot of complicated chemical names mentioned in this article. whenever possible, the chemical name will be followed by its trade name (the name the druggist) would recognize such as amobarbital [Amytal]). Also, some of the common street names for these drugs will be mentioned as well such as blue devils or blues for Amytal.

A few definitions of terms will help to understand the material in this booklet. The general definition of a CNS depressant has already been given. A sedative is a drug which tends to produce a calming effect, relaxes muscles, and relieves feelings of tension, anxiety, and irritability. This also is the definition given to what is commonly called by the public as a "tranquilizer." Another drug term used is a hypnotic. This has no relation to hypnosis. A hypnotic drug is a drug which will cause a person to sleep. As an example, chloral hydrate is classed as a strong hypnotic. Since many of these drugs, depending on dose, have both a sedative and a hypnotic effect, they are often referred to as sedative-hypnotic drugs (Carroll, 1989, p. 180).

One term that will be discussed throughout the drug program is tolerance. There are several different types of tolerance. Four of these types will be defined here (Carroll, 1989, p. 89,90/Inaba & Cohen, 1990, p. 41-2,117).

1. Dispositional tolerance - This type of tolerance is what
   people usually think of when they hear the word, tolerance. The body becomes more efficient in disposing of the drug as use continues. More of the drug is needed over time to keep the same drug effect or "high."
2. Select tolerance - When a drug is used, there is normally a
   wide dose difference between a therapeutic (effective) dose and a deadly dose. As dispositional tolerance increases, the dose needed to produce overdose of death does not increase as rapidly. After a period of time, the difference between an effective dose and a deadly dose may be very small.
3. Cross-tolerance - As tolerance to taking drug A builds,
   automatically tolerance is built up to drug B, even though it was not taken. Cross-tolerance is normally within the same drug family only (eg. narcotics, sedative-hypnotics, etc).
4. Age-dependent tolerance - The older a person becomes, the

more severe is the reaction to a drug. A particular drug may be five times more potent to a 60 year-old than to a 16 year-old. As a person ages, the body, particularly the liver, becomes less able to break down a drug.

Another term that is important to understand with sedative-hypnotics is cross-dependence. It is a fairly well known that when a person is physically dependent on a drug, the body has adapted to the drug and now needs it to stay "normal." When cross dependence is present, another drug can be substituted for that drug to prevent the body from becoming sick and to say "normal." All sedative-hypnotics are cross-dependent with each other. The barbiturate, phenolbarbital, is often the drug used by drug detoxification hospitals to slowly remove a physical dependence problem to a person addicted to sedative-hypnotics (Blum, 1984, p. 192-3/Carroll, 1989, p. 183).

The level of use of sedative-hypnotics in America is astounding. In the 1960's and 70's, it was estimated that there were between 20 and 25 million users of prescription CNS depressants. This figure was prior to the explosion in the use of the minor tranquilizers. The United States used about 300 tons (that is 600,000 pounds) per year at that time. Since the early 1970's. barbiturate use has been largely replaced by the "safer" benzodiazepines (Valium, Librium, etc). A 1968 survey of California adults showed that 30 percent had used prescription or nonprescription sedative-hypnotics or "tranquilizers" at one time or another. approximately 500,000 of the 20-25 million users are abusers of CNS depressants. Some critics of the overuse and over-prescription of sedative-hypnotics call America the "tranquilized society" (Blum, 1984, p. 171/Carroll, 1989, p. 184,193).

The following are a series of excerpts from a book titled: Why Take the Risk published by the National Institute of Drug Abuse in 1985. The quotes illustrate the dangers of using sedative-hypnotics while driving.

Tranquilizers are central nervous system depressants (drugs that slow down the body) and help relieve tension and anxiety. Major and minor tranquilizers, such as chlorprozamine (Thorazine) and diazepam (Valium), can have pronounced effects on driving skills.

Studies show that prescribed doses of tranquilizers can affect driving skills by slowing reaction time and interfering with eye-hand coordination and judgment. Warnings that caution against taking these medications while driving are often ignored. Recent research suggests that driving skills are most impaired in the first hour after a tranquilizer is taken.

Flurazepam (Dalmane) is a widely prescribed sleeping pill. Studies show that this drug accumulates in the body, and the buildup can impair driving skills, even the morning after. Elderly people must be especially careful when driving the day after taking this drug, since the drug remains in their bodies longer than it does in younger persons.

Other sedative-hypnotic drugs, including barbiturates and Quaaludes, are chemical sedatives that calm people or help them sleep. Sleepy drivers are a hazard on the road. Mixing these drugs with alcohol can double the effects of both and is extremely dangerous.

If your doctor prescribes a tranquilizer or sedative, make a point to discuss how the drug will affect your ability to drive safely. Driving requires a combination of thought and motor skills, a great deal of common sense, and a concern for the safety of everyone on the road. Safe driving requires an observant eye, a steady hand, and a clear head. By mixing drugs with driving, you are only asking for trouble. Why take the risk?

BARBITURATES

History

All barbiturates are made from a chemical called barbituric acid which wad discovered in 1863. The discovery was made by Adolph von Baeyer in a Belgian laboratory. The first barbiturate to be made from the acid was called barbitol. It was made in 1903 by two German scientists who were looking for drugs which could combat the effects of anxiety and nervousness. It was sold under the name of Veronal and is still sold today (Henningfield & Almand Ator, 1988, p. 9).

There were few drugs available at that time for anxiety or vervousness. Narcotic drugs such as opium or morphine were available, but they were known to be addicting. Their only use was during a medical emergency. Some salts made from bromine were used, but long-term use led to bromide poisoning. Chloral hydrate could be used to put someone to sleep, but it tasted bad and gave users extremely bad breath (Henningfield & Almand Ator, 1988, p. 9).

The two scientists found that barbitol could put animals and humans to sleep. It was quickly put into widespread use as a hypnotic. In about 1912, a second barbiturate was discovered which was a sedative-hypnotic. It could cause relief from anxiety, relaxation, and sleep. The name of this new drug was phenolbarbital. It was sold under ther name of Luminal and is still available today. Because it is a "long-acting" barbiturate (more about what is long-acting later), it is very useful in the emergency treatment of convulsions and seizures (Blum, 1984, p. 166/Henningfield & Almand Ator, 1988, p. 10).

Since that time, more than 2,000 similar chemicals have been developed. Of these, only about 50 are marketed for public use. They gave doctors effective tools to treat anxiety and sleep problems. The barbiturate family are relatively oderless, tasteless, and do not leave an after effect of bad breath. The doctors learned that at the right dose, they could relieve anxiety, and at a higher dose they could cause sleep (Henningfield & Almand Ator, 1988, p. 10).

Shortly after the barbiturates were being used widely, reports of problems started to be known. Reports of fatal poisining began to be reported. As the drug's use spread and grew, so did the number of deaths linked to them. In the mit-1950's, 70 pwercent of all admissions to Copenhagen's poison treatment center sere for barbiturate overdose (Henningfield & Almand Ator, 1988, p. 10).

Classification

Each of the barbiturates have a different way of acting when taken. The normal classification method is by the length of time of the drug's effects. The five classifications are as follows:
print 249 Ultrashort acting - given by injection. The person
is normally anesthesized before the injection is completed. The duration is from 15 minutes to 2 hours.
print 249 Short acting - The duration is 4 hours or less.
print 249 Intermediate acting - The duration is 4-6 hours.
print 249 Long acting - The duration is hours or longer.
These values are approximates only. Several factors such as dose size, individual physicall differences, and how the drug was taken (by mouth or incection) can cause the duration to differ (Carroll, 1989, p. 185/Henningfield & Almand Ator, 1988, p. 10).

Following is a table of various common barbiturates listing the drug name, brand name, duration and abuse potential. This is not a total list, but a list of the most common barbiturates (Carroll,

1989, p. 185/Henningfield & Almand Ator, 1988, p. 11).

Drug Name	Brand Name	Duration	Abuse potent
secobarbital	Seconal	short	high
pentobarbital sodium	Nembutal Sodium	short	high
talbutal	Lotusate	short	moderate
secobarbital and amobarbital	Tuinal	short-intermediate	high
butalbital	Sandoptal	short-intermediate	moderate
amobarbital	Amytal	intermediate	high
butabarbital	Butisol	intermediate	moderate
phenobarbital	Luminal	long	low
thiopental	Pentothal	ultra short	low

SOME REASONS FOR USE

People who use prescribed barbiturates discover that taking a smaller dose than that needed for sleep will produce a drowsy feeling of sell-being similar to that produced b alcohol. This feeling attracts those who do not need the drug and overuse by those who do to use it (Carroll, 1989, p. 182).

Many recreational users are trying to bury some bad feelings or are trying to feel pleasure through drug use. They enhoy the feelings of relaxation and peace, decreased tension, and sense of euphoria (sense of reasonable happiness) that barbiturates produce. A term, disinhibition euphorea, is often used to descrub the effects of barbiturates and sedative-hypnotics in general. This describes a level of drug use where inhibitions are lost, feelings of anger, rage, and even depression may surface. The person has a high, happy feeling similar to alcohol. In fact, barbiturate intoxication is very similar to alcohol intoxication. Currently the short-acting barbiturates are primarily to get high and, therefore, have the highest potential for abuse (Blum, 1984, p. 180/Carroll, 1989, p. 182).

There is also a strong tendency for multiple drug use. An amphetamine user will often use barbiturates as well. One may be used to counter the effects of the other. Also, 50 percent of the harcotics (heroin, etc) users may use barbiturates as well. The barbiturates are used to enhance the effects of the narcotics. As many as 30 percent of them are dependent on both narcotics <u>and</u> depressents.

How Barbiturates Work

As was mentioned earlier, <u>all</u> barbiturates are classed as CNS depressants as they reduce activity in the CNS (brain and spinal cord). This is done by blocking the normal electrical activity between brain cells. Since, depending on dose, they can cause sedation (calming) or hypnosos (sleep)_, they are called sedative-hypnotics. At higher doses, hypnosis cah lead to anesthesia (loss of sensation). Still higher doses can lead to coma and ultimately death. Depending on dose, barbiturates can calm a person or kill a person (Blum, 1984, p. 177).

Even though barbiturates cause a person to sleep, they reduce the amount of dreaming the person does. Experts feel that a "normal" person dreams from three to six times a night. When a person suddenly stops using barbiturates after regularly using them, he or she may have excessive dreams

or even nightmares (Blum, 1984, p. 177).

Each barbiturate is chemically unique. Monor changes in the chemical structure of the various barbiturates determine characteristics such as how quickly a particular drug takes effect, how long it will act, or how much of a dose is required for sleep. Each barbiturate is unique in its effective rate and duration, and these factors are dependent on such things as how quickly the barbiturate reaches the brain and how the body breaks doen the drug by the liver and/or stores it in the body's fat. The liver is the primary organ which breaks doen most barbiturates and other sedative-hypnotics. The waste products are normally eliminated in the urine (Henningfield & Almand Ator, 1988, p. 12).

The length of thime it takes for the effects of a barbiturate to wear off is also controlled by its chemical properties. Short-acting barbiturates ends their first phase of effect when the drug moves from the brain to other parts of the body. This occurs in about 15 to 20 minutes. Barbiturates that are not quickly changed by the body for hours may continue to produce what is called a drug hangover. Taking short-acting barbiturates while a barbiturare such as this is in the body could lead to a drug overdose. for a long-acting barbiturate such as phenolbarbital, it takes up to five days for one-half of the dose to be eliminated by the body (Henningfield & Almand Ator, 1988, p. 13).

Tolerence and Dependence

When barbiturates were first marketed at the thrn of the twentieth centyry, there was not the strict and rigorous testing of new drugs that there is today. As a result, drugy tolerance and dependence of barbiturates was not known when they were released to the druggests. Three of the four previously discussed types of tolerance are are found with barbiturates. They are dispositional, select, and cross-tolerance. It is important to note the effect of select tolerance on barbiturate abuse. The difference between a lethal dose and a hypnotic dose can vary, and it can be very narrow. If there is a sizeable portion of a long-acting barbiturate still in the body, what was normally a hypnotic cose of a short- or intermediate-acting barbiturate now can cause a drug overdose (Henningfield & Almand Ator, 1988, p. 13/Inaba & Cohen, 1990, p. 42,116).

Another very important fact to understand about barbiturates is the issue of drug dependence. Barbiturate physical dependence can occur when eight to ten times the normal dose is taken for up to 30 days. The dependence is very powerful. Attempting to withdraw from barbiturates can be life threatening. As stated earlier, there is a strong cross-dependence between all barbiturates (ie. a different barbiturate can be substituted for a physically dependent barbiturate) (Inaba & Cohen, 1990, p. 116,130).

Barbiturate Withdrawal

Once a person is physically dependent on barbiturates, "cold turkey" withdrawal can kill a person. Addicts withdrawing from narcotic drugs such as heroin who "cold turkey" will have a very difficult time, but there is a very low probability of dying during the withdrawal period. Because of the danger during barbiturate withdrawal, it should be done in a controlled, monitored environment, preferably in a hospital (Blum, 1984, p. 191/Carroll, 1989, p. 187).

The withdrawal symptoms from barbiturates can be life-threatening. They can start as quickly as 12 hours after the last drug dose and peak within about 24 to 72 hours. the shorter-acting barbiturates tend to have a quicker, more severe set of withdrawal symtoms, and the ling-acting barbiturates tend to produce less severe though much linger withdrawal symptoms (Blum, 1984, p. 192/Henningfield & Almand Ator, 1988, p. 15).

The symptoms start with nervousness, weakness, insomnia (can't sleep), hausea, and shaking of the arms and legs. They become progressively worse with vomiting, a drop in blood pressure, extreme weakness, delirium (confusion, halluciations), overly exitable, fever, and severe convulsions or seuzures. Death can result from physical exhaustion and/or collapse of the heart blood vessels (Blum, 1984, p. 190/Henningfield & Almand Ator, 1988, p. 15).

Because "cold turkjey" withdrawal is so dangerous, a different approach must be taken. S physically dependent user must be withdrawn from barbiturate use gradually. To aid in the dithdrawal process, the fact thet cross-dependency exits is used. Phenolbarbital is substituted for the particular barbiturate that was used, and the dose is the equivalent phenolbarbital dose for the origional drug. It is used because it is a long-acting barbiturate, and it has a greater overdose safety margin (Blum, 1984, p. 190-1)

A table has been generated which lists an quivalent dise of phenolbarbital for the particular drug and dose level that caused the addiction. That dose of phenolbarbital is then substituted for the addicting drug. The addict is then checked for either overdose or withdrawal symptoms. If the symptoms are present, the phenolbarbital dose is adjusted accordingly. The dose is then gradually reduced over the next one to four weeks. Even after completely stopping phenolbarbital use, some withdrawal symptoms such as some anxiety and sleep problems can last for up to six months (Blum, 1984, p. 193-4/Carroll, 1989, p. 187).

Treatments have been developed to handle addictions to barbiturates and other drugs. An alcohol-barbiturate addiction uses an adjusted dose of phenolbarbital to compensate for the alcohol and the barbiturate. A heroin-barbiturate addict is placed on a methodone maintenance program while he or she is withdrawn from the barbiturate. Then the hethodone can be withdrawn gradually (Blum, 1984, p. 193).

Barbiturate Overdose Problems

Due to the effect of select tolerance, it is very easy to overdose because the toxid (deadly) dose is known known to the user until it is too late. Each barbiturate will have its own toxic dose size and that dose can be very close to the tolerance level for that drug. Mising various barbiturates (short-acting, long-acting, etc) can be very dangerous because of cross-tolerance and cross-dependence. Apprximately 15 percent of all accidental deaths due to poisoning are due to barbiturates (Blum, 1984, p. 180/Carroll, 1989, p. 186).

Accidental dueat due to barbiturates was called automatism. Automatism is where a person wakes up in a drug stupor from the first dose of a barbiturate. He or she takes a second dose "forgetting" that the first dose was taken. The second dose results in a fatal oferdose condition. One study of over 900 barbiturte overdose cases showed only two were actually attributed to atuomatism. This reason appears to be a convient way to hide the fact that a person had commited suicide. Barbiturat overdose accounts for about 20 percent of all suicides (Blum, 1984, p. 180).

Mising alcohol and barbiturates is extremely dangerous. A barbiturate overdose can occur at a much loser level that what is the tolerance level if alcohol is used as well. This is expecially if the barbiturate being used is a short-acting one. The rapid action of a short-acting barbiturate such as Seconal coupled with alcohol which is also a depressant, has caused many deaths. Reaction time and judgment affected greatly, but the person does not realize the level of impact on him or her of mixing barbiturates and alcohol together (Blum, 1984, p. 607/Carroll, 1989, p. 186).

Some of the symptoms of barbiturate overdose are as follows (Carroll, 1989, p. 186):
p 249 Confused behavior, often with slowed, slurred speech.
p 249 Possible aggresive behavior.

p 249 Slow, shallow, or irregular breathing.
p 249 Glazed eyes with a slow reaction to light.
p 249 The person may be either partially conscious or unconscious. He or she may be in a coma.
p 249 It is very hard for the person to stay awake.
p 249 If he or she falls asleep, the person is hard to awake.
p 249 The muscles may be either rigid or loose.

If you are involved with a pssible overdose victom, here are some things you can do (Carroll, 1989, p. 186):

p 249 Keep the overdise victom awake by taklking to him or her.
p 249 If the person falls asleep or is unconscious, watch out for a stoppage of breathing.
p 249 Give mouth-to-mouth resuscitation if the person has stopped breathing.
p 249 Keep the airwas open so the person can breathe.
p 249 Place a unconscious person on his or her side.
p 249 If the person is conscious, try to get the person to vomit to get rid of any remaining drugs in his or her stomach.
p 249 Get the person to the nearest emergency medical center as soon as possible.
p 249 Watch for any signs of emotinal depression and suicidal tendencies.

Barbiturate Effects

As we covered earlier, barbiturates are sedative-hypnotics. That is, at a low dose, they have a calming effect. As the dose is increased, the effect increases to euphoria, sedation, hypnosis, and general anesthesia. At still higher doses, coma and even death can result. As the list of effects is esamined, the sedative and hypnotic effects of barbiturates are strongly dose-related. The effect will vary from use to use and individual to individual. The effect is not only dose-related, but the drug user's previous experience with it.

Another important factor in what determines a barbiturate's effect is what the user expects it to be. As an example, if a user expects to sleep with, say, a 100 mg dose of Seconal, then the result will be sleep. If the person, with the same dose of the same drug, expects to "have a good time," the result of taking the drug will produce a state of excitement or disinhibition euphoroa (Blum, 1984, p. 180).

There are several symptoms of barbiturate intoxication. They include such things as unsteady walk, slurred speech, uncontrolled eye movement, poor coordination, and poor judgment. There are also personality changes, mostly due to disinhibitation euphoria. Personality problems are made worse; a minor slight or imagined insult might result in rage or violence. A person may become more child-like. Emotional depression to the point of suicide is also possible (Blum, 1984, p. 180/Henningfield & Almand Ator, 1988, p. 17).

Other effects of barbiturates on the body are they can depress breathing, there is some lowering of blood pressure, they can further damage an already damaged liver, and large doses can greatly decrease body temperature. A hypnotic dose (one which causes sleep) reduces the amount of dreaming a user does during the period the drug is active. Dreaming appears to be a mormal part of sleep. After people are rapidly withdrawn from barbiturates, they may have an excessive amount of dreams or even nightmares (Blum, 1984, p. 177-8).

Barbituates & Driving

Even though there are many benefits to the use of barbituates, their use can cause problems. One of these problems is the use of barbituates while driving. A driver must be alert to everything going on around him or her. The sense of sight is especially important. When using barbituates, a driver is often unable to judge distance and speed as well as before, and he or she has problems adjusting to changing light levels. As was mentioned earlier, someone using barbituates will have poor coordination. This can cause a driver using barbituates to be too slow to apply the brakes or too fast to press on the acceleration. Also, the time to react to something from the senses (light change, horn blowing, or see a car swerve) is slowed. This change during response time can be very dangerous
during hazardous driving conditions (rain, winding roads, etc) or during rush hour heavy traffic conditions (Henningfield 19).

Several studies have shown that barbituate use cause driving errors which lead to fatal accidents. In a particular test, several different driving situations were simulated such as light changes, course changes, and emergency situations. The barbituates were given in a way to simulate a tooth extraction.
The tests were given at two, four, six, and eight hours after injecting the drug. At the two hour period, the drivers felt that they had impaired driving skills. At four hours, only half felt that they were still impaired. By six or eight hours after the drug was injected, most drivers felt that they were back to normal. Test results indicated something very different. They showed that driving skills were not back to normal until well past the eight hour peiod. The poor driving performance period was much longer than the normally accepted period of impairment for a particular class of barbituates, in this case ultra-short-acting (Henningfield 20).

A silmilar study using a flight simulator and pilots. In this case, testing did not begin until 10 hours after the drug Seconal (a short-acting barbituate) was given. The testing continued for twelve more hours. Again, there was still impaired pilot performance 24 hours after using th drug. This is much longer
than the observed effects period for a short-acting barbituate
(Henningfield 19,20).

What these studies show is that the "normal" published periods of barbituate inpairment are not accurate if the user must make very fine judgements such as those found while driving and flying. The actual period of impairment is much, much longer than that stated in the Classification Section; approximately four times longer. A person may think he or she is "normal" after taking a barbituate, but there is still a period well after the visual effect have worn off where that person is a danger to him or herself or others if he or she drives. This would also be true for anyone using barbituates and machinery such as would be found in a factory or construction site.

Levels of Barbituate Abuse

As it was mentioned earlier, reports of barbituate abuse started soon after the fast barbituate (Barbital), was release fo public use. During the 1940's, barbituate abuse was so common that magazines such as Callier's started a campaign against the non-medical use of them. In the 1950's, the non-medical use of barbituates was widespread and was the preferred way to get "high." During the 1960's, barbituates abuse had spread down to teenagers and younger children. They probably got their drugs by raiding their parent's prescriptions inthe medicine chest. To show how serious the problem had become, in 1964 out of 50.400 poison treatment cases in England and Wales, 16.300 or 32 percent involved people who had taken barbituates (Henningfield 20,1).

To show the level of barbituate abuse in schools, recent surveys show that 15 percent of high

school seniors had tried barbituates at some time, and about 4 to 5 percent had used them in the past year. In a may 1972 survey of Los Angeles city schools, barbituates were the leading school drug problem, ahead of even alcohol and marijuana. In a 1980 survey of New York young adults, showed that 10 percent had used non-prescription sedatives includinf barbituates by the age of 18, but by the age of 25, the majority of these that used the non-prescription barbituates had risen to 19 percent. One other fact in the New York study was that adolescent users were more likely than nonusers to start using illegal drugs. One encouraging fact is that barbituate and other sedative use appears to be decling (Bleem 171, Henningfield 21,4).

One of the problems is that barbituates abusers may use other drugs as well. barbituates may be taken with narcotic drugs heroin, ect) in the mistaken belief that the barbituates will lighten the narcotic's effect. Others amy use barbituates with amphetamines to try, without success, to try to make the "high" even more potent. Barbituates are also used to bring a metamphetamine "speed freak" down and to sleep after several days of steady drug injection. As was indicated earlier, it is very dangerous to mix barbituates with other drugs (Carroll 185, Henningfield 22).

Even though drug a buse by famous athletes and entertainers makes spectacular headlines, it is now realized that professional people such as doctors, lawyers, and other people in high-profile, high-status jobs are also drug abusers. In many cases, cocaine, various amphetamine, and marijuana are the preferred drugs by these people, but often barbituates are commonly used as well. They are used in a attempt by the drug abuser to try to even out the mood swings caused by the other drugs (Henningfield 22).

Because of their abuse potential, all barbituates are classified as dangerous drugs. Most of them are classified as schedule III drugs by the federal government. The short-acting barbiturates such as Seconal and Amytal are classified as schedule II drugs because of their widespreed use and addictive potential (Carroll, 1989, p. 15).

NONBARBITURATE SEDATIVE-HYPNOTICS

Introduction

These drugs have all of the characeristics of sedative-hypnotics. they show cross-tolerance and cross-dependence with barbiturates. They are physically addicting if used long enough. the cross-dependence feature is used during withdrawal by substituting phenolbarbital for the dependant drug. Because of their abuse potential, they are classified as schedule III or IV drugs.

CHLORAL HYDRATE

Chloral hydrate is one of the oldest sedative-hypnotics still in use today. It was invented in 1862 and is now sold under the name of Beta-chlor. It has few side efects when used in doses to cause sleep. The major side effects consist of an alcohol-like "hangover," depressed breathing, and extremely bad breath. Its use dropped considerably after the introduction of barbiturates starting in 1903 (Carroll, 1989, p. 187/Henningfield & Almand Ator, 1988, p. 9).

A usal dose of 500 mg. (milligrams) will put someone to sleep for about five hours. The mixing of chloral hydrate and alcohol is called a "Micky Finn" or "knockout drops." This combination is a quick, fast method to put someone to sleep. Again, mixing a sedative-hypnotic such as chloral hydrate with alcohol can cause deadly results (Carroll, 1989, p. 187).

As with other sedative-hypnotics, chloral hydrate is deadly in high doses (approximately 10 grams), and it can result in physical dependence sith prolonged use. Withdrawal symptoms from

it are similar to that of alcohol. The drug is rerely used as a "recreational" drug today. The only misuse of the drug is mainly by elderly people who use it as a sedative despite the fact that it tends to give them a upset stomach (Blum, 1984, p. 201/Carroll, 1989, p. 187-8).

GLUTETHIMIDE

This drug was first ihtroduced in 1954 as a barbiturate substitute. It is marketed under the name of Doriden. Its use was to combat sleeplessness and was originally thought to be less toxic (deadly) and dependence-prone than the barbityurates, vut, as with many drugs, it did not live up to either of the expectations. During the 1970's and 80's, Doriden was used on the street with codine, and was called by such names as "loads," "sets," "setups," etc. The two drugs, a sedative-hypnotic and an opiate, enhanced each other. One of the problems caused by this combination was that a person would become addicted to both a sedative-hypnotic and an opiate, and would have to be withdrawn from each separately (Carroll, 1989, p. 188/Inaba & Cohen, 1990, p. 121).

It takes about 30 minutes after taking glutethimide before it takes effect. The effect lasts for about six hours. If a person were to take about 10 times the dose, he or she would be intoxicated. At about 20 to 40 times the hypnotic dose, it becomes deadly. This deadly dose corresponds to about 10 to 20 grams (Blum, 1984, p. 201/Carroll, 1989, p. 188).

A dose of 1.5 to 2 grams per day for a month will be enought to dead to physical dependence. Because glutethimide is a long-lasting sedative-hypnotic drug, it is very hard to reverse an overdose condition which could then lead to death. One of the problems with the drug is the way it acts in the body. It is removed from the blood by the liver, condentrated in the gall bladder, and then released back into the intestine and, therefore, back into the blood. This drug is several times more dangerous than barbiturates because of its effects due to an overdose (Blum, 1984, p. 201/Carroll, 1989, p. 188/Inaba & Cohen, 1990, p. 121).

METHAQUALONE (QUAALUDE)

Methaqualone was introduced into the United States in 1965 as a "safe, effective, and nondependency-producing" substitute for barbiturates. Its initial trade name was Quaalude. Some other brand names were Soper, Mequin, Sommafac, and Parest. By the 1970's, it was one of the most often prescribed sedative-hypnotics. It was soon learned that methaqualone was not safe and was dependency-producing. Because of the level of abuse and overdose problems, especially if combined with alcohol, it was finally classified as a schedule I drug by the federal government.

Methaqualone becaue extremely popular and was thought to be safe. It quickly became a will-used recreational drug. Some of its street names were "ludes," "sopers," "sopes," or "lemons." The drug was used to produce an alcohol-like euphoria and a feeling of relaxation. Quaalude was thought to be an aphrodesiac (enhance sexual performance). What it really does is to remove inhigitions (disinhibition) against sex which makes it easier to permit sexual activity (Blum, 1984, p. 204/Carroll, 1989, p. 188).

When Quaalude is used, it produces a variety of symptoms and effects. We have already indicated its disinhibition effect (loss of inhibitions) which is similar to alcohol. Other symptoms may incude loss of coordination, dizziness, sleep, a "hangover" the next day, nausea, vomiting dryness of the mouth, diarrhea, and a rapid heart beat (called tachycardia by doctors). It is physically addicting with use of about two grams per day for a month. It can produce severe withdrawal symptoms which incude siezures. Unsupervised methaqualone withdrawal can produce death. Quaalude poisoning and overdose occurs if abyt eight grams are taken. An overdose condition is

much easier if Quaaludes are taken along with alcohol (Blum, 1984, p. 203-4/Carroll, 1989, p. 188).

Methaqualone is no longer manufactured legally in the United States. Any street-available Quaalude now is either smuggled into the U.S., made by street chemists, or more likely something else shich could range from Benadryl (an antihistime) to Valium to something very dangerous, PCP (Carroll, 1989, p. 188-9/Inaba & Cohen, 1990, p. 121).

MINOR TRANQUILIZERS

Introduction

As a group, the minor tranquilizers include meprobamate (known as Miltown or Equanil) and the benzodiazepine drug family. There are about 10 drugs in this family, and they are commonly thought of as "tranquilizers" as some of the brand names are Valium amd Librium. All minor tranqulizers produce disinhibition euphoria to some degree. They all show cross-tolerance and cross-dependence with barbiturates such as phenolbarbital. they can be physically addicting with prolonged use. Most of them are listed as schedule IV drugs by the federal government. Normally, as a group, the minor tranquilizers do not have a hypnotic effect (put someone to sleep). This class of drugs is mainly the domain of middle-class, middle-age America. They are not normally used by young people (Blum, 1984, p. 195/Carroll, 1989, p. 180).

MEPROBAMATE

this was the first drug that started the age of antianxiety drugs. It was first marketed during the mid-1950's under the names of Miltown and Equanil. It also led to the first realization that a legally prescribed and used drug could cause a person to become addicted to it. Even though it was somewhat less toxic (deadly) than barbiturates, excessive use led to psychological and physical dependency (Carroll, 1989, p. 191/Inaba & Cohen, 1990, p. 121).

Even though meprobamate has a muscle-relaxing effect, it was soon found to have an antianxiety effect (to relieve worry). It was soon prescribed for relief of anxiety (worry), tension, and muscle spasms. Its success was related to its ability to calm without producing sleep at low theraputic (normal) doses of 1200-1600 mg/day. It provided relief without heavy sedation (Carroll, 1989, p. 191/Wessen et. al., 1992, 272).

Physical dependence could be achieved by doses of 2400-3600 mg/day (about twice the normal dose) for about 270 days. Seizures would result if the drug was suddenly stopped. If a user was physically addicted to Miltown, phenolbatbital could be used because of the effect of cross-dependence to gradually withdrqw the person from Miltown. A person could die by taking as little as 12 grams of Miltown (Blum, 1984, p. 202).

BENZODIAZEPINES

Introduction

Soon after meprobamate (Miltown) was released to the public, a new family of drugs was discovered. The first drug of this family was marketed in 1960 and was called chlordiazepoxide or Librium. Its use spread quickly as a new drug for the "age of coping." About three hears later, a second frug in this family, diazapam or Valium, was marketed. Valium was 5 to 10 times more potent than Lirbium. these drugs and others in the family were a tremendous benefit in the

treatment of anxiety disorders. They quickly replaced barbiturates, bromides, opiates, and even alcohol which were too toxid and had too many side effects. In the 20 years since Valium was released, it was one of the top fifteen most prescrubed drugs (Carroll, 1989, p. 191-3/Inaba & Cohen, 1990, p. 117).

The majority of the benzodiazepines are classified as sedatives and prescribed as antianxiety drugs to reduce tension if taken in the proper doses under supervision. They are used to relieve mental tension, excited behavior, cuscle tenseness, and sometimes insomnia. They are less sleep producing than other sedative-hypnotics. Their widespread use for quick relief of a life problem (job pressures, family problems, marital difficulties) caused overdose problems and life-threatening visits to hospital emergency rooms. They are classified a schedule IV drugs by the federal government (Carroll, 1989, p. 15,195).

The following table lists some of the common drugs in this family (Wesson et. al.,1992, p. 272/Inaba & Cohen, 1990, p. 119).

Chemical Name	Trade Name	Use	Half-life (hours)
Very long acting			
flurezepam	Dalmane	hypnotic	90-200
halazepam	Paxipam	sedative	30-200
prazepam	Centrax	sedative	30-200
Intermediate acting			
chlorodiazepoxide	Librium	sedative	7-46
diazepam	Valium	sedative	14-19
clonazepam	Clonopin	anticonvulsant	18-50
Short acting			
temizepam	Restoril	hypnotic	5-20
alprazolam	Xanax	sedative,antipanic	6-20
axazepam	Serax	sedative	6-24
lorazepam	Ativan	sedative	9-22
Very short acting			
triazolam	Halcion	hypnotic	2-6

Physical Effects on the Body

As was stated earlier, this drug family is sidely prescribed because of the known dnagers of other drugs such as barbiturates. One thing about these drugs is that they have what is called a safe therputic index: that is the normal "theraputic" (effective) dose. Another thing to note is that this family of drugs tends to stay in the body for a long period of time as shown by the half life (the time it takes for one-half of the drug to be broken down by the body) values as shown on the previous table. This can lead to a dangerous accumulation (buildup) of the drug in the body.

These drugs appear to act like and intensofy the actions of certain neurotransmitters (chemical messagers in the brain). The one in particular which inhibits (blocks, reduces) brain activity is called GABA for short. The drugs also appear to influence other similar neurotransmitters such as serotonin and dopamine (Inaba & Cohen, 1990, p. 120).

There are tolerance effects of these drugs. The two examples of tolerance that are shown for this family of drugs is dispositional and age-dependent tolerance. The exact definitions of these tolerances are explained on page 1 and 2 of this booklet (Inaba & Cohen, 1990, p. 117).

Overdose, Addiction, and Withdrawal

Even though the level to cause an overdose may be 50 times the normal dose, it is still useful to recognize an overdose condition. Overdose symptoms include drowsiness, loss of consciousness, shallow breathing, coma, and death. It is very easy to overdose iv benzodiazepines are mixed with alcohol. People have died from a few pills and a small amount of alcohol (Inaba & Cohen, 1990, p. 118/Wesson et. al., 1992, p. 277).

At this point, stopping the use of benzodiazepines will cause withdrawal symptoms. These symptoms can be very severe, including death, especially of the person is withdrawing from high-dose levels (10 to 20 times normal). Apparently, more people have died from Valium withdrawal than from Valium overdose. High-dose and low-dose withdrawal will be treated separately (Inaba & Cohen, 1990, p. 118/Wesson et. al., 1992, p 275-7).

Low-dose benzodiazepine withdrawal can be a very uncomfortable experience. Withdrawal symptoms will start anywhere from 1 to 7 days after the drug is stopped. The symptoms may include anxiety, agitation, tachycardia (rapid heart beat), loss of appetite, blurred vision, muscle cramps, insomnia, nightmares, confusion, muscle spasms, psychosos (disconnect from reality). increased sensitivyt to light and sound, and sensations of prickling, tingling, or creeping of the skin. As time goes on after stopping taking the drug, the symptoms will come and go; each time the symptoms reappear, they will be less severe. It may take from 6 months to a year before they disappear completely (Wesson et. al., 1992, p. 277).

High-dose benzpdiazepine withdrawal is more like withdrawal from short and intermediate length acting barbiturates. There is a pronounced peak which starts two to three days after stopping short-acting benzodiazepines and five to eight days after stopping long-acting benzodiazepines. The symptoms will begin one ot two days after stopping short-acting benzodiazepines and three to eight days after stopping long-acting benzpdiazepines. The symptoms will stop after two to three weeks. The symptoms are much more severe and consist of anxiety, insomnia, hightmares, severe seizures, psychosis, very high fefer, and possible death (Wesson et. al., 1992, p. 267-7).

As with other sedative-hypnotics, a high-dose benzodiazepine dependence can be treated by substituting a specific dose of phenolbarbital for the abused benzpdiazepine and then gredually withdrawing the person from the phenolbarbital