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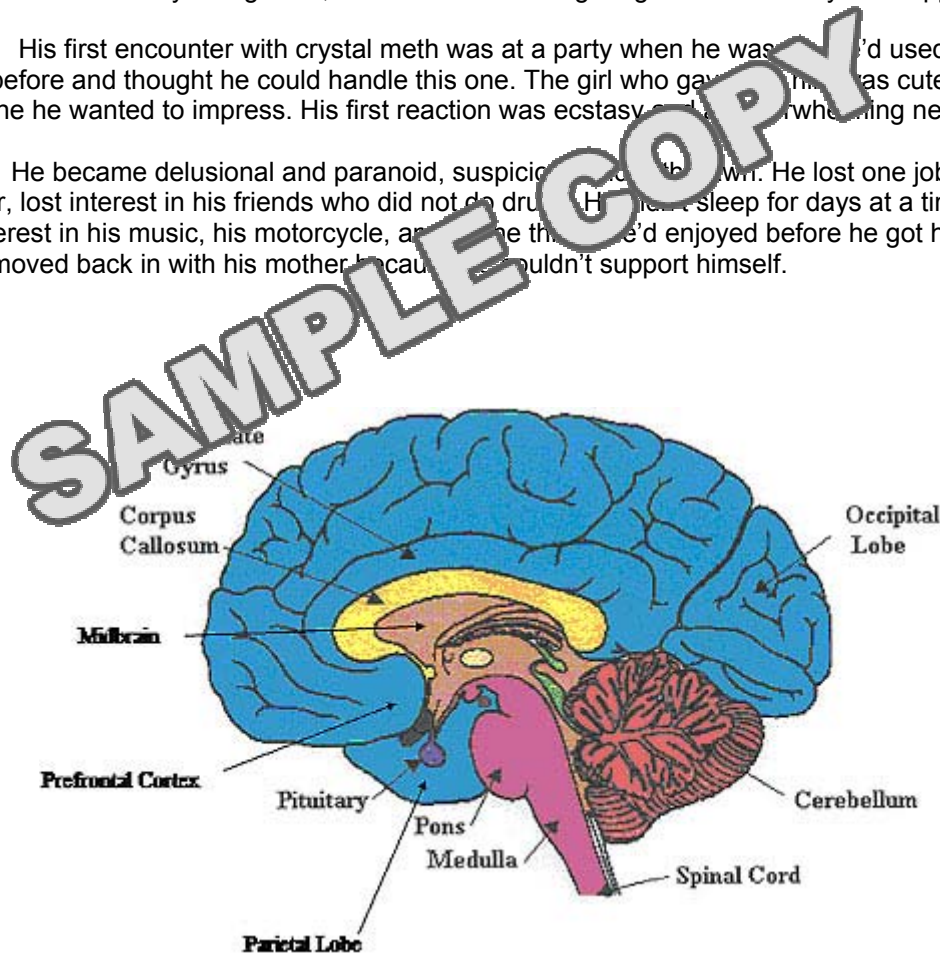


**Methamphetamine, Ice, Glass, Crystal, Chalk,  
Speed, Crank, Go-fast**

My brother Jim was twelve or thirteen when he first used pot and poppers behind the junior high he attended in Missouri. We put him in a residential treatment program when we discovered it. Formerly a bright kid, he almost flunked eighth grade. Eventually he dropped out of school.

His first encounter with crystal meth was at a party when he was 17. He'd used lesser drugs before and thought he could handle this one. The girl who gave him the drug was cute, someone he wanted to impress. His first reaction was ecstasy and he had a growing need to do it again.

He became delusional and paranoid, suspicious of everyone around him. He lost one job after another, lost interest in his friends who did not do drugs. He couldn't sleep for days at a time. He lost interest in his music, his motorcycle, and everything he'd enjoyed before he got hooked. At 23 he moved back in with his mother because he couldn't support himself.



## The Brain On Methamphetamine

Let me explain how this drug works and how it affects your brain with a little anatomy lesson. Look at the diagram. The brain is organized into areas with specialized functions.

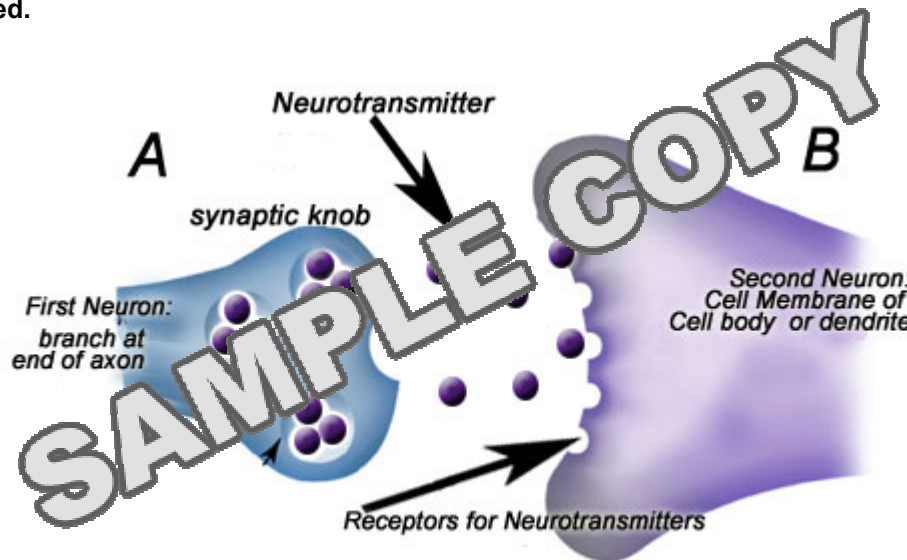
The back of the brain is called the occipital lobe; it processes visual information from the eyes and forms the images we see. The back of the brain is your movie screen. When this lobe is affected by meth, you see things that are not really there. You see snakes on your movie screen, and they are so real, you will shoot those snakes.

The front of the brain is the frontal lobe, where you do your complex thought and reasoning. You exercise your judgment for the future using the frontal lobe. When it is damaged by methamphetamine, you do stupid things.

The very front of the brain is called the pre-frontal cortex; it processes emotional information like anger, and happiness, what we call moods. When it is affected by methamphetamine, you have emotional hallucinations. You feel rage when there is nothing to be upset about and terror when there is nothing to be afraid of.

The parietal lobes are on the sides of the brain. They control movement and sensation, the sense of our location in space. They control the muscles of the arms and legs, and the sense of feel. When affected by methamphetamine, they cause the sensation of bugs crawling on your skin.

The mid-brain structures are the center of the personality, who you are as a person, your self control, your strength of character. They contain your temper, ability to love someone, your sex drive, appetite and sleep cycle. When the personality centers are damaged by meth, you become a different person, moody and irritable, anxious and depressed.



### How Does Meth Work?

The connection between two nerve cells is called the synapse. Cell A is the sending cell; cell B is the receiving cell. Cell A releases a chemical called a neurotransmitter into the gap between the cells, and cell B has receptor on it to receive the neurotransmitter. Once the signal is received, cell B sends a feedback message that indicates the message has been received. Cell A then reabsorbs its neurotransmitter and the signal ends. This process is extremely fast, on the order of microseconds. The information is encoded a lot like Morse code. Click, click, click. The interval and frequency of the clicks sends the content of the message.

Cell A and Cell B have been talking like this for years, using dopamine as a neurotransmitter. Then one day cocaine or meth-amphetamine comes along and disables the transporter molecule so that dopamine is flooded into the synapse at 1000 times the concentration these cells have ever seen before. Cell A is stuck in the 'on' position. It's like you took the lid off the fire hydrant and all the water comes gushing out.

The high meth produces is the result of a surge of dopamine in the midbrain structures and personality centers. Marijuana, alcohol, and cocaine also produce increases in dopamine in the same parts of the brain, but in a different way. The dopamine surge in the structure called the pleasure center [basal ganglia nucleus accumbens] produces a feeling of euphoria, energy, alertness, and focus. Cocaine produces a feeling like sexual arousal in high doses. It is a hallucinogenic substance.

When the dopamine is completely used up, the brain goes into the crash, which at first is just a mild depression. After a few days, it gets worse. As the pleasure center is damaged from over stimulation, the crash lasts longer. It feels achy, depressed, tired, grouchy, hungry, empty, and anxious, and it lasts for 7-10 days. It's not just a mild depression anymore, it's a crash that controls your life.

When Cell A pumps out dopamine at 1000 times the normal concentration, it's not a click anymore. It's like the cell is screaming at the top of its lungs for 12 to 20 hours. If you were to scream at the top of your lungs for 12 to 20 hours your voice would get hoarse. The dopamine transporter molecule also gets hoarse, its vocal cords rupture and it can't talk. The transporter molecule is permanently damaged and it no longer sends appropriate signals, even when the drug has worn off.

Cell B on the other hand has been listening to click, click, click all of its life, and it understands the morse code.. Now, instead of the click, click, click, cell B is used to, it hears a siren in its ear. And the siren blasts in it's ear for 12 to 20 hours.

Cell B sends a signal back to Cell A saying "Enough already, I heard you" But its not cell A doing the screaming. It's cocaine or meth-amphetamine that's doing the screaming, and it won't stop. Cell B might put up with this abuse once or twice, but if it happens too many times Cell B will eventually disconnect its telephone line and destroys its own receptor, and now Cell A and Cell B do not talk to each other anymore. Normal signals that used to pass through that connection are no longer conducted.

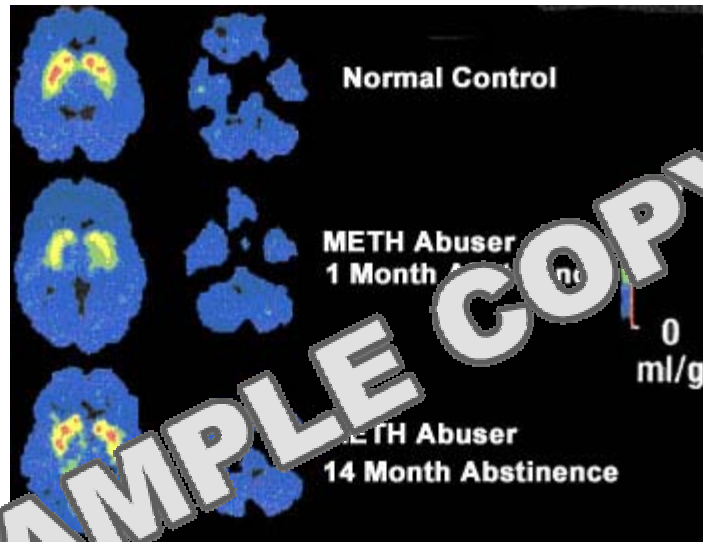
As receptors are destroyed, it takes more and more drug to get high; eventually you don't get high anymore, no matter how much drug you take. All you do is stay out of withdrawal. You now have a \$200-\$300 a day habit to stay normal.

One night Jim was at a party when the guy next to him started having chest pain. He got nauseated, started sweating, and he asked the other people at the party to call an ambulance, but they didn't. They were using meth and they didn't want the ambulance people to know. The guy had a heart attack and died right in front of Jim.

The party was over. Everybody freaked out. They flushed the drugs and hid the lab. Jim's fingerprints were on the flasks in the guy's lab, and he thought he would be arrested for the murder of the man who died. He wanted to run away to Mexico. My mother couldn't handle him, so she brought him to my house to see if I could take care of him.

He lived with me for just over a year. We took him to a psychiatrist and he was diagnosed schizophrenic. Paranoid schizophrenia is a brutal diagnosis, but it can be managed with medications, and we were prepared to cope with that for the long term. But the medications didn't work. He had a drug-induced paranoia and nothing helped him.

## Brain Scan Changes



The middle side is a PET scan of a brain on meth. The top is a normal brain with red dopamine transmission through the mid brain. In the second brain, there is no red transmission through dopamine pathways in the midbrain. All the phones have been disconnected.

That means the central brain no longer has control over the rest of the brain. You no longer have control over mood and emotion. You have personality changes, you are paranoid, you are irritable and grouchy. You have twitches and tremors and muscle spasms. You can't eat or sleep. You have panic attacks that go on for days. Cravings control your life.

The connections in your brain are eventually restored after about a year off meth. That's how long it takes for Cell B to make new dopamine receptors, and for Cell A to repair its vocal cords. You can see that in the picture of the third brain. There is red transmission in the dopamine pathways in the midbrain.

As connections are reformed in the first year of *abstinence*, there is significant improvement. The cravings are not so strong. The panic attacks are less frequent and severe. The paranoia and delusions improve. You start taking care of yourself and you can control your anger and rage better. You start eating better and sleeping more. The tremors and muscle spasms get a little better each day. The recovery you see at one year is all the recovery you are going to get. Any residual damage after one year is likely to be permanent.

What you'll also notice in the third brain is the little holes in the substance of the brain. These are not just the normal fluid collections in the brain; these are new holes where brain tissue was supposed to be.

Methamphetamine is made out of

- Battery acid
- Anhydrous ammonia
- Kerosene
- Red Devil Lye
- Antifreeze
- Hydrochloric acid
- Coleman fuel
- Red phosphorus
- Iodine
- Drain cleaner

## The Battery Acid Effect

I call this the *Battery Acid effect*. You don't have enzymes to metabolize meth-amphetamine. It is not a natural product. Methamphetamine is made out of battery acid, anti-freeze, and Red Devil lye. You can't break this stuff down into carbon dioxide and water like you do everything else. Your body turns it into *hydroxyl free radicals*. These are caustic chemicals and they eat holes in your brain.

The holes are in a central part of this brain tissue does not get better. You learn to work around the holes. The brain compensates by using other parts of the brain, but you do not replace the dead tissue. This is serious damage to a central part of the brain. When midbrain and pre-frontal cortex brain cells are disabled, there is no other structure in the brain that can assume their functions. The areas that process mood and emotion are destroyed, and the result is paranoia [uncontrolled fear], rage [uncontrolled anger], panic [uncontrolled anxiety], delusions, and hallucinations [uncontrolled perception].



The areas that control coordination are damaged and the result is involuntary body movements (uncontrollable twitches of the fingers, face, and lips). I met a man in jail who had a constant chatter in his teeth. They were there day and night, and had been doing that for two years. That constant chatter is never going to go away.

Flashbacks of rage and paranoia are common. Jim had a little cat he'd had since he was 10 years old. One day he had a flashback to rage and started beating his cat. He loved that cat. He almost killed it. He had a flashback to killing his cat and he couldn't stop himself.

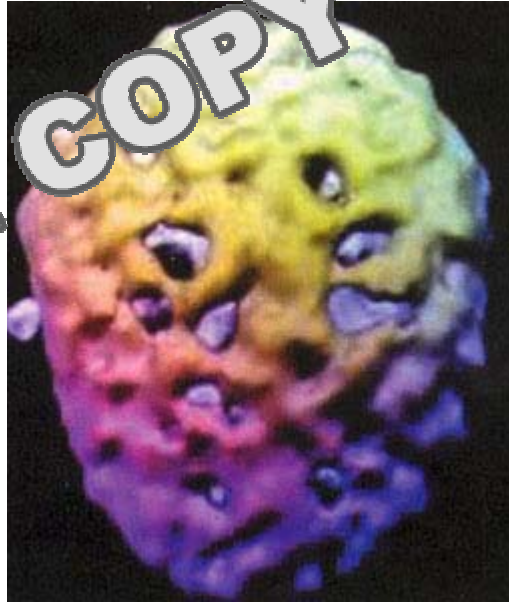
The paranoia is completely irrational. The UPS man comes to your neighbor's house with a package. You think he's a narc with a gun and he's after you. The cops are hiding in the trunk outside. They have satellites that can read your mind. You misinterpret innocent gestures and accuse people of ridiculous things.

Panic attacks can go on for days. When Jim first came to live with me he would spend days in a corner of the closet crying, wouldn't eat, couldn't sleep, a catatonic panic attack. Every time the phone rang, he was under the table. If someone came to the front door, he went out the back door. The other kind of panic attack is the manic panic attack. You have to go, go, go, can't hold still. You get behind the wheel of a car, go 200 miles per hour and run everybody off the road.

Short term memory and learning ability are lost. You get a new job and they try to train you to run the register. A week goes by and you still don't get it. Two weeks go by, you're not catching on. After three weeks of training, you still can't do your job, they fire you. You can't get past the training sessions in any job.

You lose the ability to feel pleasure. Nothing feels good anymore. Sex doesn't feel good, talking to your friends doesn't feel good, playing your guitar doesn't feel good.

Early signs of damage include severe depression, insomnia, moodiness and irritability, violent and aggressive behavior, inability to concentrate, memory loss, and anorexia. Other long-term effects include malnutrition, disorganized lifestyle leading to chronic unemployment, inability to learn new things, and complete loss of self-control.



As the brain heals, these functions improve. You learn to work around the holes and regain function. It takes 12 to 18 months to regain your old personality, your attention span, your sense of humor, your sex drive, and your appetite. Cells build new connections and your rage and paranoia fade, flashbacks and tremors go away, and you get your old self back.

But the wiring is different now, and some of the damage is permanent.

Jim could function as long as he stayed clean. He found some friends at his new job and started drinking and using again. He was so irrational and dangerous I had to move him out of my house. He moved into an apartment and a job, and tried to continue therapy.

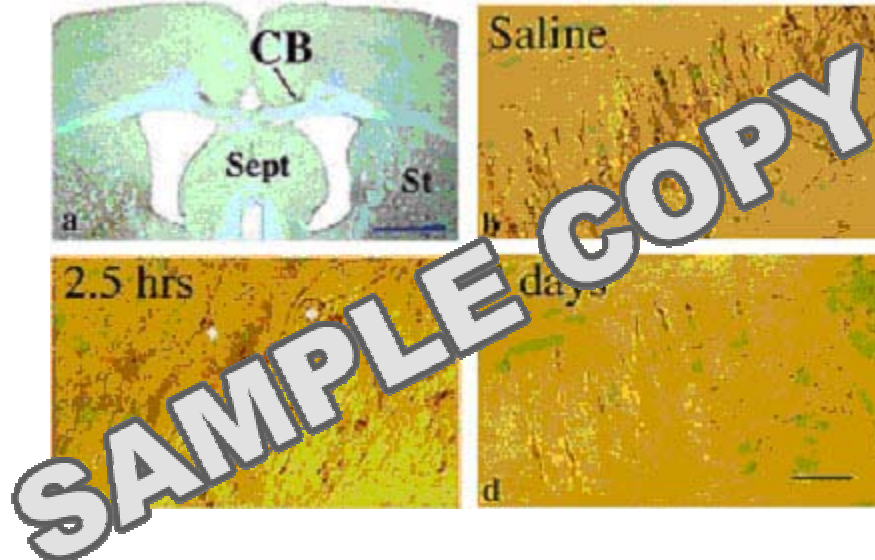
He went through 12 months and quit treatment. He couldn't get past the training sessions in court. He kept getting fired. He was arrested twice on public intoxication. The day before his court date he skipped town and went back to my mother's place. I checked him into a hospital when he attempted suicide, but they wouldn't keep him past the 72-hour emergency commitment. He was using heavily again, and getting more and more paranoid.

### The Self Control Tract

There is one tiny tract in the brain, called fasciculus retroflexus, that is essential for self control. It is the area that gives you, your conscious mind, control over urges, drives, and cravings, so that *you* control your impulses. *You* control your desires. It is a

tiny little tract, only 150 – 200 cells, and they are extremely sensitive to drugs of abuse. Alcohol can kill those cells, it takes about a year to do it. Cocaine can kill them in about six weeks. Methamphetamine can do it in just one night.

### Fasciculus diagram



These cells are the self control tract cells spread out like peanut butter so you can see them better, in the panel marked 'saline'. Looks like about 100 cells here, good healthy neurons. The left lower panel, marked 2.5 hrs is those same cells about two and a half hours after a single intoxicating dose of methamphetamine. Look at those cells. They are swelling up and breaking apart. They are *dying* right before your eyes.

Now look at the ones in the last panel marked 4 days. This is four days after just one dose of methamphetamine. How many cells do we have left? I count about six. We turned 100 cells into six cells and we did it in one night. But you couldn't feel anything happening. You use it once, and within, one month, perhaps within one week you will use it again. You think you just wanted to use it again. No, you had a desire to do it again and you couldn't control that desire. You didn't choose it, it chose you.

The brain is rewired to want drug. Severe craving is wired into your brain so that anything that reminds you of your drug will set off the craving. A new smell causes drug craving. The sight of the house you used to party at will remind you of the smell of marijuana, the sound of party music, aluminum foil, a spoon, anything you associate with the drug experience can be a trigger to cause an uncontrollable craving for more meth.



### **Now What?**

OK, so now what? Your brain is damaged. How do you quit what's left of your life? How do you quit damaging what's left of your brain?

You have to quit using drugs. Even pot is not safe. It stimulates the midbrain areas that the meth has damaged and makes you want more. Unfortunately, the part of the brain that controls compulsive and addictive behavior is the self control tract [fasciculus retroflexus] which is the first place the meth is processed. Intense drug craving is elicited by the smell of marijuana, the sight of a pipe, a piece of tin foil, the sound of party music, the friends you used to share your drug with.

### **What's So Bad About Pot?**

*Marijuana's active ingredient, THC, causes swelling in the synapse, the gap between nerve cells in the brain. Instead of rapid discrete clicks across the synapse, the neurotransmitter sloshes across the wider than normal gap between cells. Information is encoded in the interval and frequency of those*



clicks like Morse code. You can't read the interval and frequency between slashes like you can clicks, and so a lot of the content is lost because the signal is a slash instead of a click.



...ing and the car in front of you stops suddenly. You run right into the back of it because you are slosh sloshing instead of click clicking. You run a lawn care business and I hire you to do my lawn. I ask you to mow the lawn, do the edging, and trim the bushes. You mow the lawn, you kind of remember something about the edges, and you forget all about the bushes. "I just forgot, man."

With long term daily use, the brain tries to compensate by releasing more neurotransmitter with each signal, so as to get the message across this swollen synapse. Now you can drive while you are high, but you don't get as much of a high anymore. When the drug wears off and the swelling goes down, the sending cell is still releasing twice as much neurotransmitter as it usually does. The result is that everything feels too harsh. Sounds are too loud, lights are too bright, clothes feel too rough, muscles are tense, and it's hard to think. Withdrawal symptoms include irritability, hostility, restlessness, anxiety. The only thing that will make it all feel right again is another joint- swelling because it feels better.

Marijuana's active ingredient, THC, stimulates a receptor in the brain called an anandamide receptor. The normal function of this receptor is to suppress excess dopamine activity in the brain. When pot binds the receptor, it does not function normally. It acts as a receptor blocker. When this happens, dopamine is overactive, and the result is a mild high. We're at a party, someone tells a joke and we all laugh. Then we go on to talk about something else but you are still giggling about the joke we told ten minutes ago. You sound pretty stupid.

Multiple other drugs cause a high by increasing the amount of dopamine in the brain, most notably methamphetamine, cocaine, and alcohol. Marijuana use is a common precursor to cocaine and methamphetamine addiction. I have met very few meth addicts who did not start with marijuana. It removes the barrier of fear that keeps some people from trying hard drugs. It creates an

appetite for stronger drugs, and a tolerance for the side effects. People frequently use pot to help relieve the symptoms of 'coming down' from a meth or cocaine high.

We think "A little pot won't hurt anything. I can handle that." Pot stimulates the same neural pathway that cocaine and methamphetamine do. We can't expect to play with this part of the brain and expect to be in control by using it. We can't compromise with drugs. Marijuana is the tease drug that leads to the bigger drugs. We know better than to play with drugs, we should know better than to play with pot.

Jim was convinced the cops were out to get him. They were going to torture him and kill him. He thought they could read his mind and knew where he was and what he was thinking. He was in a bad dream, but he couldn't wake up. He couldn't tolerate the pain.

He found his uncle's house and shot himself in the head on the 4th of July 2000. When they closed the casket on my little brother, my older brother had to hold me. Don't tell you how bad it hurt to lower him into the ground.

## Your Friends Matter

Nobody gets out of the fifth grade and starts shooting crystal. Nobody wakes up one day and says, "Hey, I'd like to become a junky and waste my life on methamphetamine!" It starts out as a beer and a joint. They get you drunk and make you feel like you can handle this stuff. If you hesitate, they use it in front of you and show you how cool it is. They pass around a pipe with crystal meth in it. The music is playing loud and everybody is laughing at you. You'll do it once just to get off your back. Once is all it takes.

If the only friends you have are people who use drugs, you are likely to use drugs too. You will do anything to stay 'in' with that group. You are responsible for your choice of friends. You are responsible for the choices you go to and how long you stay. The choices we make have consequences. The decision to use drugs affects your entire future, your learning ability, your health, and even your personality.

Don't compromise. Keep your parties clean. Don't tolerate a little weed. Know when to get out of control. Have backup transportation to get home in case you get out of control. Have backup transportation to get home in case you get out of control. Don't be a friend.

Be willing to make your friend mad if he insists on using drugs. You go to your friend's house and he pulls a bag of pot out of his bottom drawer. You say, "No thanks." He says, "What's the matter, you scared? Afraid your Mommy will find out?" You say, "Sorry, I don't do drugs. Doing drugs is stupid?"

Your friend is likely to get mad at you, call you a church boy, a narc, a snitch. "You gonna turn me in?" If this friendship is the only meaningful relationship you have, you are likely to cave in. "No I'm still your friend, I'll try a little." Remember, pot is a common starter drug. It stimulates the same brain areas that meth does. We can't compromise with pot and say it's OK.

It's not easy to tell your friend to get lost when he gets out the dope. You have to do it anyway. If the friendship means anything to him, he'll respect your decision and may even quit using it himself. You are responsible for your choice of friends.

You have exactly one chance to make a choice about this drug. Once you have tried it you no longer have any choices. You become its slave. Crystal meth damages the brain with its first use. The pathway in the brain that controls emotion; fear, anxiety, and anger; is overwhelmed and damaged. Nothing will satisfy the craving, or relieve the anguish of the crash, except more meth. Jim described it as a leaky blood brain barrier. He wondered if there was a medicine to repair it. There is not.

### Courage to Quit

It takes a lot of courage to quit a drug. You have to tolerate withdrawal symptoms and walk away from trigger things that remind you of drugs. You have to reorganize your whole life. You have to cut out relationships that hurt you, drag you back into drugs. You have to find new relationships that help you avoid triggers and learn to have fun without drugs. Triggers are everywhere and you can't go through life without running into them. You need help. Recovered addicts are extremely vulnerable to relapse for the first three years after quitting drugs.

Level up your parents and tell them what's going on. Show them this booklet and ask for some help. They will respect you a lot more if you are up front with them than if you wait until you get arrested and the cops call them from jail. Let them explode and get mad, and then let them get you some help.

### Resources to Help You Quit

**SAMHSA** National database of government approved substance abuse treatment facilities organized by state and zip code. 1-800-662-4357  
[www.findtreatment.samhsa.gov](http://www.findtreatment.samhsa.gov)

**Teen Challenge** is a national association of Christian rehabilitation centers that serves both teen and adult addicts in six to twelve month programs in rural settings. [www.teenchallenge.com](http://www.teenchallenge.com) or P O Box 1015 S. Main St. MO 65801 1-417-862-6969

**Addiction Resource Treatment Guide** gives information about drug treatment centers at [www.addictionresourceguide.com](http://www.addictionresourceguide.com) P O Box 8612 Tarrytown NY 10591 1-914-725-5151

### MAMA

**Mothers Against Methamphetamine**

**P O Box 8 Arab AL 35016**

**1-866-293-8901**

**[www.mamasite.net](http://www.mamasite.net)**