Effects of Alcohol and Other Drugs on the Driving Task

INTRODUCTION

- In Idaho, 40% of all fatalities involve an impaired driver, an impaired pedestrian, or an impaired bicyclist. So we could eliminate almost ½ of all deaths refraining from alcohol and drugs?
- Alcohol is the most widely used drug and the one most often linked to motor vehicle crashes. WHY?

EFFECT OF ALCOHOL ON THE BODY

- Unlike most food, alcohol does not have to be digested
- Once swallowed, it is absorbed directly into the blood stream through the walls of the stomach and small intestine within one to two minutes.
- However, if there is food in the stomach, this absorption process will be slowed.
- When alcohol reaches your brain it promotes relaxation and in large amounts dulls your brain

EFFECT OF ALCOHOL ON THE BODY

- Feelings
  - Alcohol dulls the parts of your brain that control inhibition, judgment, and self-control.
  - As a result, you may fell stimulated, lively, and a bit giddy or foolish.
  - After about 2 to 4 drinks alcohol begins to impair your reaction time, coordination, and balance
  - Your vision and ability to judge distance suffers, making it harder to react to dangers.

EFFECT OF ALCOHOL ON THE TEEN BRAIN

- Alcohol can disrupt the adolescent brain's ability to learn life skills.
- Not only can heavy drinking during this time get the adolescent into trouble through risk taking behavior such as drinking and driving, but it can also make the brain less able to learn important life skills that can help a teen avoid trouble as an adult.

EFFECT OF ALCOHOL ON THE TEEN BRAIN

- A teen's brain develops until age 16 and needs a high rate of energy as the brain matures until age 20
  - Damage from alcohol at this time can be long-term and irreversible
- Short-term or moderate drinking impairs learning and memory far more in youth than adults
  - Adolescents need only drink half as much to suffer the same negative effects

EFFECT OF ALCOHOL ON THE TEEN BRAIN

Studies have shown adolescent drinkers

- score worse than non-users on vocabulary, general information, memory, and memory retrieval
- have 10% less verbal and nonverbal information recall
- perform worse in school, are more likely to fall behind and have an increased risk of social problems, depression, suicidal thoughts and violence
- Have their sleep cycle affected resulting in impaired learning and memory as well as disrupted release of hormones necessary for growth and maturation
- have an increased risk of stroke

Amount of Alcohol in Drinks Vary

- All alcohol beverages all contain alcohol but not necessarily the same amount.
- The alcoholic content of some beverages is stated in terms of proof, a number which is actually double its alcoholic content
  - For example: if the proof is listed as 86, the alcohol content is 43%
  - For beer, the average alcohol content is 4.5% but it may vary from 2.1% to 5.2%

ARE ALL ALCOHOLIC BEVERAGES EQUAL?

1 oz 80 Proof Whiskey

12 oz. Regular Beer

12 oz. Cooler

2 oz. Margarita

BLOOD ALCOHOL CONCENTRATION

- **Blood Alcohol Concentration (BAC) is a measure of the amount of alcohol in a person's blood expressed as a percent.**

BLOOD ALCOHOL CONCENTRATION

- All 50 states and the District of Columbia have laws defining drinking and driving as a crime to drive with a blood alcohol concentration (BAC) at or above a prescribed level
- Idaho's BAC limit is .08 percent but has recently been proposed to reduce this to .05

BLOOD ALCOHOL CONCENTRATION

- For example, if an individual has a BAC of 0.08% BAC (8/100 of 1% alcohol), this means that there is 8/10 of a drop of alcohol for every 1,000 drops of blood in a person's body
- BAC can be determined by testing a person's blood, breath, urine, or saliva.
- However, testing the breath is the quickest, least complicated and most frequently used test to determine BAC.

FIVE FACTORS AFFECTING BAC

Number of Standard Drinks

- Each drink consumed within an hour increases the BAC level

Body Weight

- The heavier the person, the more alcohol it takes to raise the BAC

Gender

- Women generally have less water and more body fat per pound of body weight than men
- Alcohol does not go into fat cells as easily as other cells, so more alcohol remains in the blood of women

Time

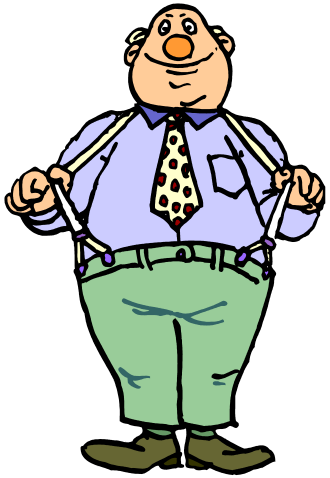
- Drinking three drinks in one hour will affect a person more than drinking three drinks in three hours

Food

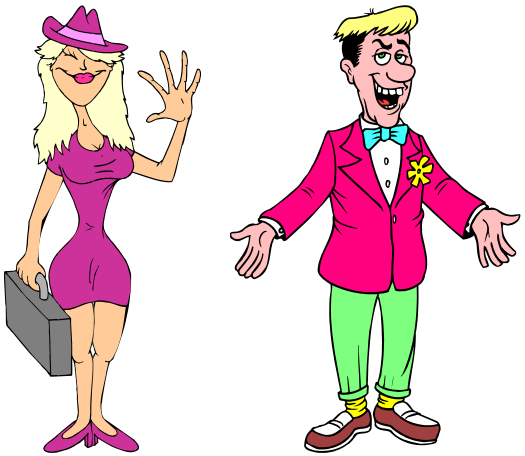
- Food in the stomach when alcohol is consumed causes alcohol to be absorbed more slowly, thus slowing down the rate and the amount of intoxication
- Food that is meant to be a good meal in the stomach (not a few potato chips) before drinking begins

BLOOD ALCOHOL CONCENTRATION FACTORS

Number of drinks



Weight



Gender

Time

Food

DIFFERING EFFECTS OF ALCOHOL

- Other factors which influence a person's effect of alcohol are:
  - Mood: a depressed person may feel the effects more quickly
  - Tolerance: a person who drinks regularly may show less outward effects because they learn to compensate for some of the effects of alcohol
  - Fatigue: a person who is tired may feel the effects of alcohol more quickly
  - Experience: How long and how much a person has been drinking

ELIMINATION RATE

- The body disposes of most alcohol through oxidation (burning) in the liver
  - The oxidation takes place at a constant rate and nothing can be done to slow down or accelerate the process
  - It continues until all of the alcohol has been burned; in other words, only time will "sober" up a person

ELIMINATION RATE

- Alcohol is eliminated from the body at the rate of about one drink per hour
- The simplest way to think about blood alcohol levels is to compare the drinking process to filling a sink
  - You can run the water tap as fast or as slow as you want, but the sink drain (in this case a very small drain), will allow it to empty only so fast
  - The "blood alcohol sink" will drain only at the rate of 0.015% BAC per hour
- Only time can sober a person who has been drinking and it is a slow process

ELIMINATION OF ALCOHOL

Breath
Urine
Sweat
} 10%

LIVER 90%

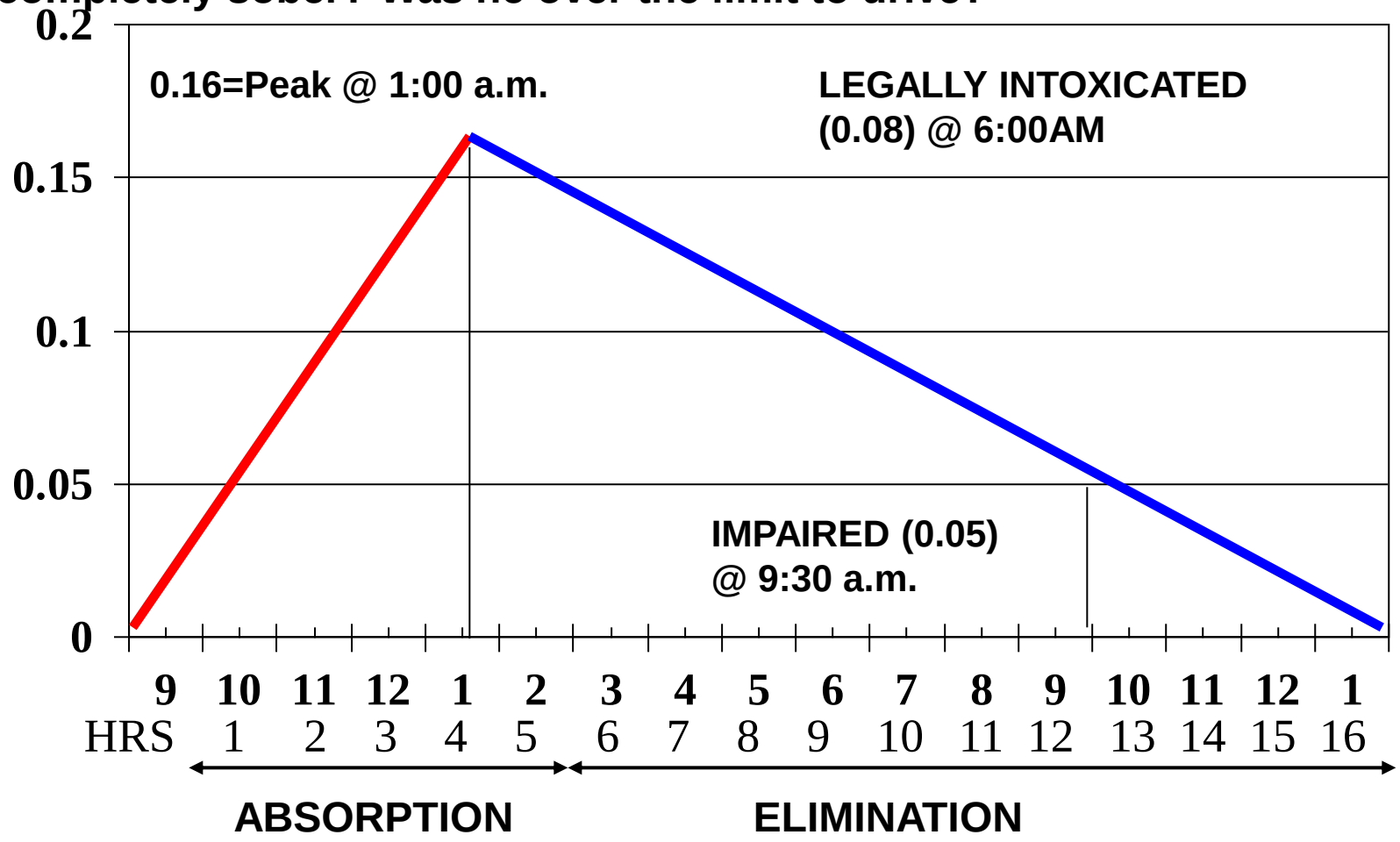
PROCESS: 

About 0.015 BAC Reduction Per Hour

Therefore:
- BAC of 0.05 = 3.5 hours for removal
- BAC of 0.07 = 5.0 hours for removal
- BAC of 0.10 = 7.0 hours for removal
- BAC of 0.15 = 10.0 hours for removal

Stops Drinking @ 1:00a.m. – Elimination

Bob stops drinking at 1:00am. How many hours will it take for Bob to be completely sober? Was he over the limit to drive?



BAC EFFECT ON THE BODY

	BAC LEVEL*
• Decision Making (1 or 2 drinks)	0.03-0.04
• Release of Inhibitions	0.04
• Reflexes	0.05-0.10
• Coordination/Motor Ability	0.10
• Confusion/Disorientation	0.15
• Stupor	0.20-0.30
• Coma	0.30-0.40
• Death	0.40 or more

This gives you an understanding as to how much a person can drink before they go into a coma or die. YES, you can kill yourself from drinking too much! And if not all at once, it can happen over the span of years of addiction.

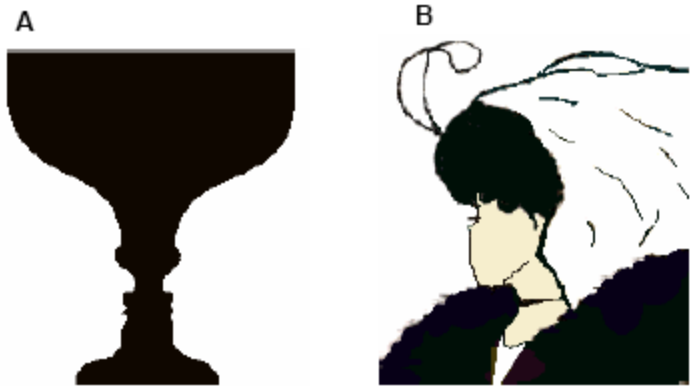
OTHER DRUGS: Marijuana

- **Marijuana is a green, brown, or gray mixture of dried, shredded flowers and leaves of the hemp plant (Cannabis saliva)**

So how would Marijuana affect your driving?

OTHER DRUGS: Marijuana

- Marijuana hinders the user's short-term memory and he/she may have trouble handling complex tasks
- Because of the drug's effects on perceptions and reaction time, users could be involved in automobile crashes



OTHER DRUGS: Cocaine

- Cocaine is a white powder that comes from the leaves of the South American cocoa plant
- Crack is a form of cocaine that has been chemically altered so that it can be smoked
- Cocaine and crack are highly addictive
- Cocaine is the powdered form of the drug, usually sniffed up the nose, but sometimes diluted and injected into a vein.
- Crack is the purest form of cocaine and is smoked

OTHER DRUGS: Methamphetamine

- Methamphetamine is a powerfully addictive and violent drug
- Its use can result in fatal kidney and lung disorders, brain damage, liver damage, chronic depression, and other physical and mental disorders
- Recent studies have demonstrated that meth causes more damage to the brain than alcohol, heroin, or cocaine

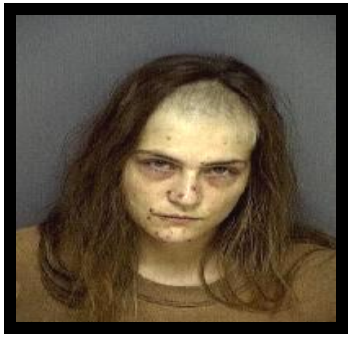
METHAMPHETAMINE

Commonly known as:

- Meth
- Speed
- Chalk
- Crystal
- Crank
- Glass
- Ice

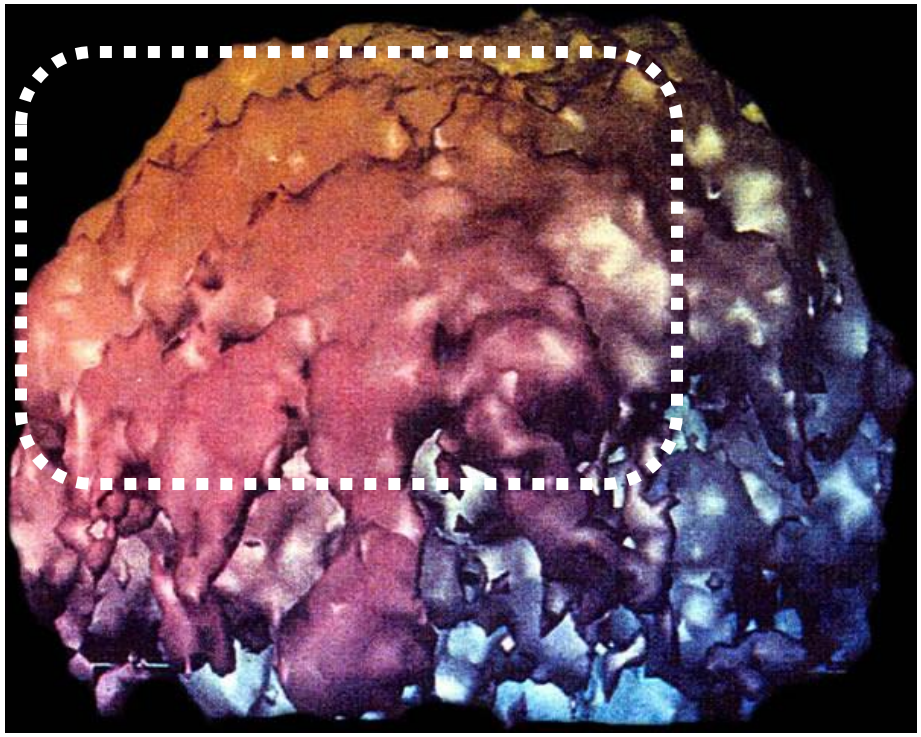
METHAMPHETAMINE

- It is a white, odorless, bitter-tasting crystalline powder that easily dissolves in water or alcohol
- Users may become addicted quickly, and use it with increasing frequency and in increasing doses
- In contrast to cocaine, which is quickly removed and almost completely metabolized in the body, methamphetamine has a much longer duration of action and a larger percentage of the drug remains unchanged in the body
- This results in methamphetamine being present in the brain longer



Source: Nebraska State Patrol

EFFECT OF METH ON THE BRAIN



Dead spots in the brain tissue appear to be brown mush

METHAMPHETAMINE

- **The toxic, acidic ingredients that make up crystal methamphetamine cause a condition known as "meth mouth," characterized by rampant tooth decay, gum disease and cracks in teeth**

A 23-year-old man's teeth after using meth for three years

Source: www/makesmartchoices.com

CONSEQUENCES OF METH USE

Ten Years of Meth Use

OVER-THE-COUNTER (OTC)

- Examples include
  - Aspirin or other pain relievers
  - Cold and allergy remedies
  - Arthritis and back pain medication

- Physical effects of OTC drugs
  - Drowsiness, dizziness, slowed reaction times, poor judgment
  - Always read the labels and know the effects that could occur

PRESCRIPTION

- Prescription drugs can be purchased only when prescribed by a doctor
- Many contain either higher dosages of the same drugs as OTC or more potent drugs with more powerful side effects than OTC
- Physical effects of prescription drugs:
- Drowsiness, dizziness, slowed reaction times, poor judgment
- Always read the labels and know the effects that can occur

STIMULANTS

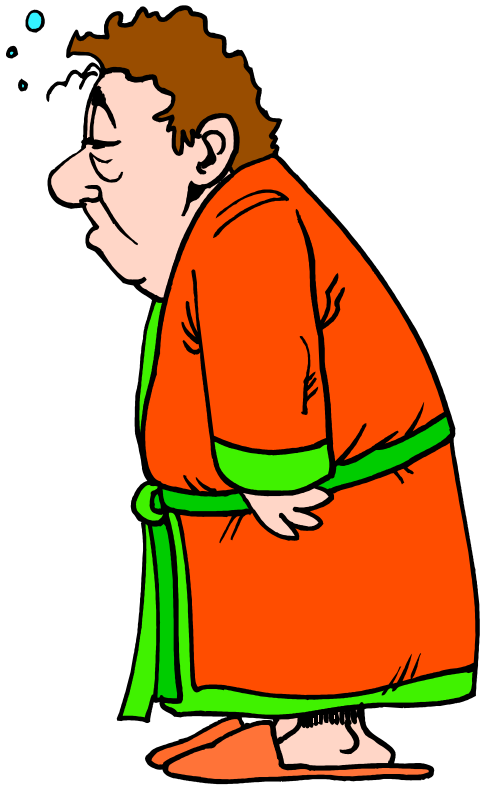
Stimulants are drugs that speed up the central nervous system

- Examples include
  - Amphetamines- speed, cocaine, crank, crack, meth
  - Caffeine- coffee, tea, soft drinks
  - Nicotine
- Physical effects of stimulates
  - Gives user a feeling of high energy and alertness leading to increased risk taking
  - Sometimes used to try and stay awake when tired
  - Reduced reaction time, impaired motor skills, dimed vision
  - Aggressive and overconfident

DEPRESSANTS

Depressants are drugs that slow the central nervous system

- Examples include
  - Barbiturates
  - Sleeping pills
  - Tranquilizers
  - Narcotics — heroin, codeine, morphine
- Physical effects of depressants
  - Become very relaxed
  - Lose inhibitions
  - Irritability
  - Confusion
  - Drowsy
  - Dizzy
  - Poor hand-eye coordination



HALLUCINOGENS

- Hallucinogens are unpredictable mind-altering drugs that alter personality
- Examples include
  - Marijuana
  - Hashish
  - LSD
  - PCP-angel dust

- Physical effects of hallucinogens
  - Can cause panic or terror
  - Distort sense of direction, distance, and time
  - Impairs judgment and decision-making
  - Fragmented thought process
  - Coordination (acceleration and braking control)
  - Altered depth perception
  - Drowsiness
  - Impaired vision
  - Impaired spatial relationships and passage of time

EFFECT OFALCOHOL ON THE DRIVING TASK

- As a drug, alcohol IS a depressant which while appearing to give you a lift can and will affect your driving skills in the following ways:
  - Judgment — The decision-making process is much slower and decisions may be faulty such as
  - Driving too fast or too slow
  - Passing unsafely
  - Inattention
  - Trying to beat a train

EFFECT OFALCOHOL ON THE DRIVING TASK

- Reaction time — It will take longer to react and move the foot from the gas pedal to the brake
- This slowed-down reaction time can be the difference between arriving safely or not arriving at all
- **Reaction time is impaired at a BAC of 0.03 (1 Drink)**
- Even though drivers may stay in their lane, they may have trouble steering straight

EFFECT OFALCOHOL ON THE DRIVING TASK

- Coordination — Hand/eye and foot/eye coordination are needed to correctly steer, brake, and accelerate
- Impairment of these driving tasks can result in loss of vehicle control
- A BAC of 0.08-.10 impairs coordination

ALCOHOL RELATED CRASHES

- Alcohol is the most widely used drug and the one most often linked to motor vehicle accidents
- Motor vehicle crashes are the number one killer of those under age 25
- A study by the AAA Foundation found that drivers age 20 or older with a BAC of 0.15 or higher were about 100 times more likely to be involved in a fatal crash than those with no alcohol in their blood
- But 16- to 19-year olds with a BAC of 0.15 or higher were 400 times more likely to die than same-aged drivers who had not been drinking
- 250,000 people have died in alcohol related accidents in the past 10 years

ALCOHOL RELATED CRASHES

- <u>Presently 25,000 people are killed each year in alcohol related accidents</u>
- 500 people are killed each week in alcohol related accidents
- 71 people are killed each day in alcohol related accidents
- One American life is lost every 15 minutes in alcohol related auto crashes
- It is estimated that one out of every two Americans will be involved in an alcohol related accident in his or her lifetime
- Young people are at highest risk

INTERVENTION TO PREVENT IMPAIRED DRIVING

- Impaired driving is 100 percent PREVENTABLE.
- What can be done to help prevent more drunk driving fatalities?
- The answer is simple—anything you have to do to stop drinking and driving
- When trying to stop someone from getting behind the wheel there is always an alternative solution

INTERVENTION TO PREVENT IMPAIRED DRIVING

- How can you tell if someone is too drunk to drive?
- What to look out for
  - Loss of coordination
  - Use of loud or profane language
  - Frequent trips to the restroom
  - Slow reflexes and reaction time

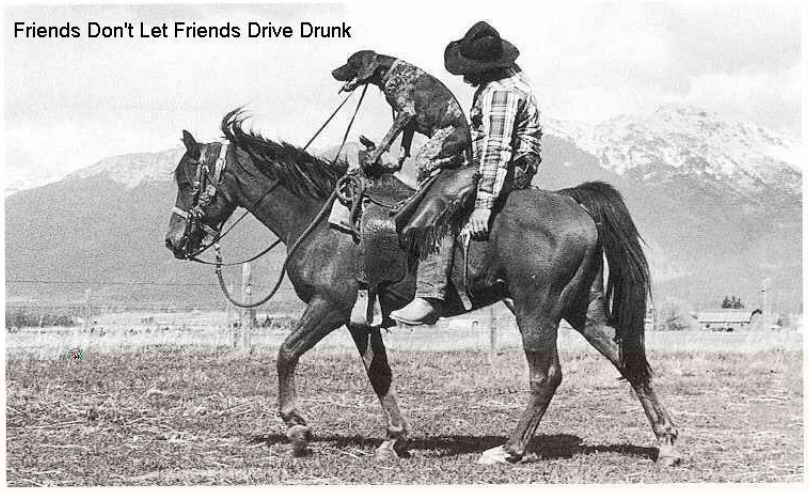
RESIST PEER PRESSURE

- A peer is someone in your own age group
- Pressure is the feeling of being pushed toward making a certain choice—good or bad
- Peer pressure is the feeling that someone your own age is pushing you toward making a certain choice—good or bad
- Peer pressure can be hard to resist

RESIST PEER PRESSURE

Here is a good way to say "no" and still be cool

- **Say what the problem is (that's mean, or, that's illegal, etc.)**
- **Say what the consequences are**
- **Suggest something to do instead**
- **If your friends insist on the behavior, leave — but leave the door open for them to change their minds and join you**



RESIST PEER PRESSURE

Different strategies work for different people, but some commonly successful strategies are:

- **Finding or inventing a reason to leave the scene**
- **Treating the suggestion as if it is not serious or making a joke of it**
- **Getting involved in a new activity with a new group of people**
- **Getting help from a trusted adult (for example, a coach, counselor, or family member)**