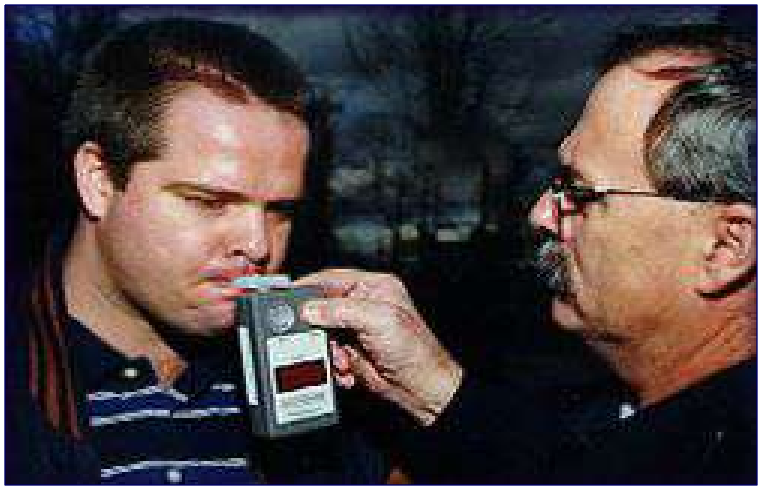
Blood Alcohol Concentration Factors

Liquor

Wine

Beer

BAC is the **mathematical** ratio of the percentage of **alcohol** in the **blood stream.**



Factors affecting BAC

- **Weight (blood volume)**
- **Time Spent Drinking**
- **Gender**
- **Food**
- **Alcohol Content and Size of Drink**

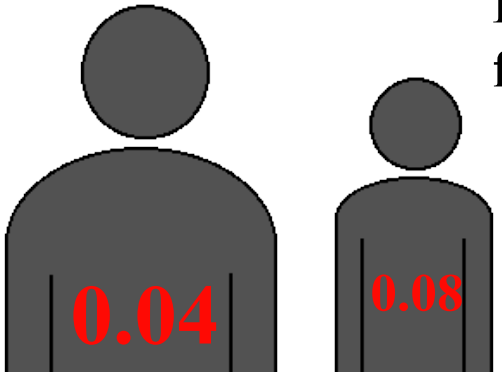
BAC Factors

Liquor

Wine

Beer

Weight



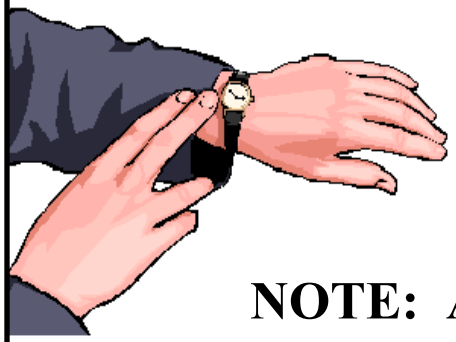
~~220 lbs~~

110 lbs

Heavier people have more blood and other body fluids to dilute alcohol consumed.

Their BAC level will be lower than the BAC of a smaller person who drank the same volume of alcohol.

Time Spent Drinking



On average, a person's BAC is oxidized at a rate of 0.015 per hour

- ✓ **90% of the alcohol detoxified is oxidized (burned up by the liver**
- ✓ **10% is eliminated in breath, urine, and sweat**

NOTE: Alcohol is toxic to the liver and brain. Hence, the term intoxication denotes the toxic effect alcohol has on these organs.

BAC Factors

Liquor

Wine

Beer

Gender

Women process alcohol at a slower rate than men. This is because they usually weigh less and produce less of the enzyme dehydrogenase needed by the liver to break down alcohol.

Men also have a higher percentage of body fluids which dilutes the alcohol.

Food

The amount of food in your stomach does very little to reduce the effect alcohol has on the brain and liver.

- **However, food does coat the lining of the stomach and slows absorption into the blood stream.**

Note: When alcohol is mixed with carbonated beverages the absorption rate is faster because gases are absorbed faster than liquids.

Are They The Same ?

Liquor

Wine

Beer

- Beer
- Whiskey
- Wine
- Cooler
- Margarita

Myth

A "DRINK" is:

- **a 12-ounce beer,**
- **a 4- to 6-ounce glass of wine, or**
- **a shot of liquor.**

Fact

A "DRINK" is ½ an ounce of alcohol.

Drink Equivalents

%	Ounces	Drink	Alcohol
4.2	12	Beer	.50 oz.
6.1	8	Beer	.48 oz.
10	5	Wine	.50 oz.
14	3.5	Wine	.49 oz.
40	1.25	Liquor*	.50 oz.
50	1.0	Liquor	.50 oz.
75	.67	Liquor	.50 oz.

NOTE: One half of the proof of the liquor equals the percentage of alcohol.

How Much Alcohol Do They Contain?

Beverage	Alcohol %
Beer	3 – 11 %
Wine	8 – 25 %
Liquor	26 - 75.5 %
Pure Grain Alcohol	95 – 100 %

How Much Light Beer?

Light Beer

	Weight	Oz. Light Beer	BAC	Oz. Light Beer	BAC	Oz. Light Beer	BAC
MALE	200	22 oz.	0.03	37 oz.	0.05	52 oz.	0.07
	180	20 oz.	0.03	33 oz.	0.05	46 oz.	0.07
	160	18 oz.	0.03	30 oz.	0.05	41 oz.	0.07
	140	16 oz.	0.03	27 oz.	0.05	37 oz.	0.07
	120	14 oz.	0.03	22 oz.	0.05	32 oz.	0.07
	100	11 oz.	0.03	20 oz.	0.05	28 oz.	0.07
FEMALE	200	18 oz.	0.03	30 oz.	0.05	41 oz.	0.07
	180	16 oz.	0.03	27 oz.	0.05	37 oz.	0.07
	160	14 oz.	0.03	22 oz.	0.05	32 oz.	0.07
	140	12 oz.	0.03	20 oz.	0.05	28 oz.	0.07
	120	10 oz.	0.03	18 oz.	0.05	26 oz.	0.07
	100	7 oz.	0.03	16 oz.	0.05	21 oz.	0.07

Based on light beer with 4.2% alcohol by volume consumed in 1 hour. NOTE: The alcohol content of light beer varies from 3.3 to 4.4 %.

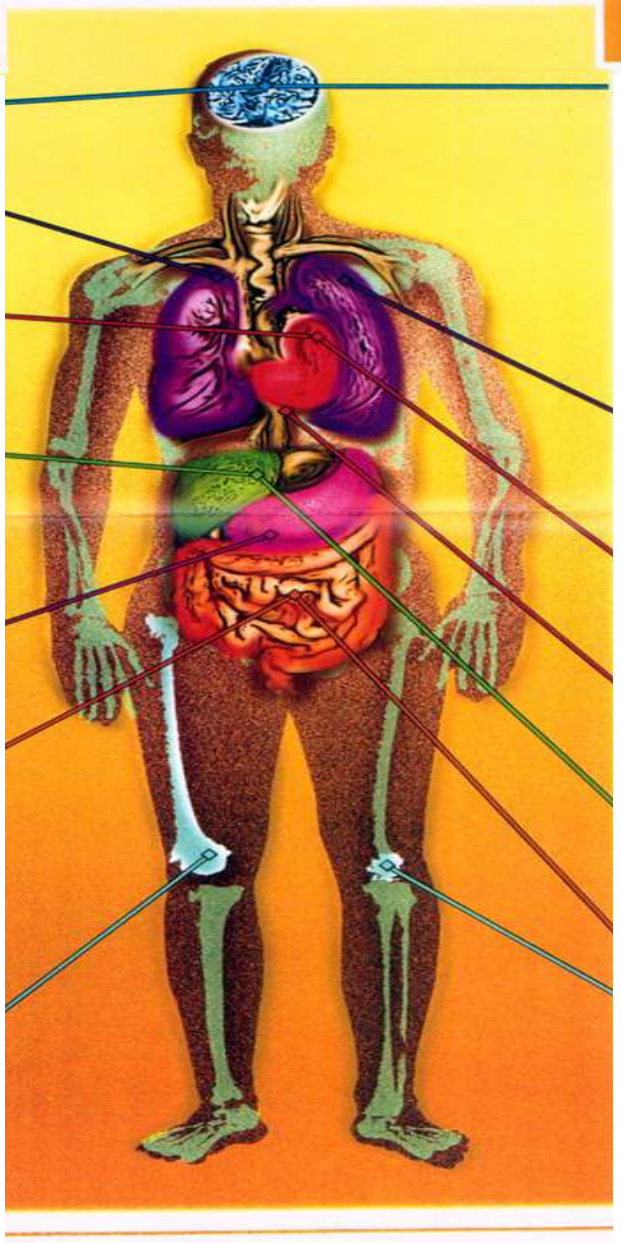
Alcohol Effects & You

Liquor

Wine

Beer

What Alcohol Can Do:	What May Happen to You:
Brain	
Lungs	
Heart	
Liver	
Stomach	
Intestines & Pancreas	
Bones & Muscles	



T – 7.12

Alcohol Effects & You

What Alcohol Can Do:

Brain
Alcohol depresses nerve cells impairing brain function.

Lungs
Large amounts of alcohol lower resistance to infection or can cause breathing to stop.

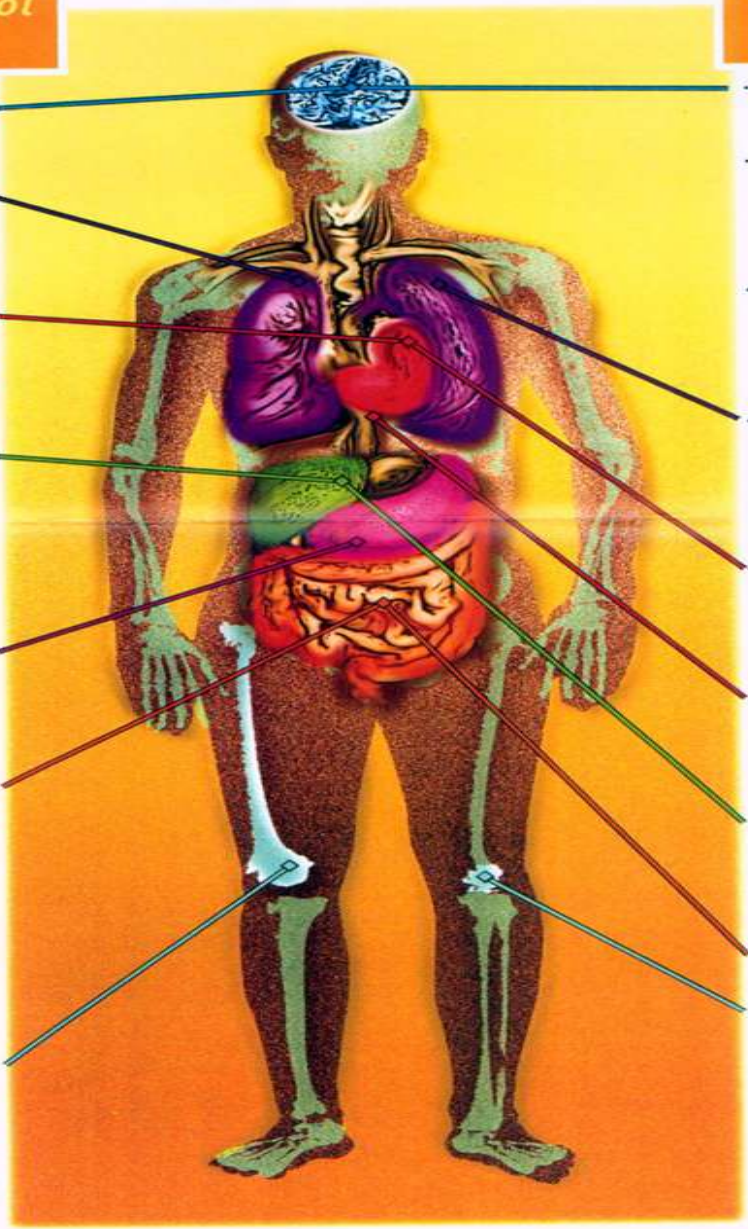
Heart
Alcohol impairs the heart muscles' ability to pump blood, leading to abnormal heart function and irregular heart beat.

Liver
Chronic heavy drinking may cause alcoholic hepatitis (inflammation and destruction of the liver cells) and then cirrhosis (irreversible lesions, scarring and destruction of liver cells).

Stomach
Alcohol irritates the stomach and can lead to peptic ulcers, bleeding lesions and cancer.

Intestines & Pancreas
Alcohol can impair the breakdown and absorption of nutrients by damaging the cells lining the intestinal tract and colon, causing inflammation, ulcers and cancer of the intestines and colon. The pancreas can become inflamed and leak digestive enzymes which attack the pancreas itself.

Bones & Muscles
Alcohol interferes with the body's ability to absorb calcium resulting in bones being weak and thinner (osteoporosis). Muscles also become weaker and uncoordinated.



What May Happen to You:

- Because your cells are dulled, altered or damaged, you initially experience mild euphoria, and loss of inhibition.
- As alcohol continues to affect regions of the brain controlling behavior and emotion, your memory, concentration and coordination become impaired. You can experience extreme mood swings and emotional outbursts.
- Your vision is impaired, your hearing is unclear, your senses of taste and smell are dulled. You experience an altered sense of time and space. Your fine motor skills are reduced as are your abilities to react. You suffer a loss of pain perception.
- As a heavy drinker, you have more pulmonary infections and can be more susceptible to pneumonia and lung collapse. You lose your reflexes and cannot clear your airway when you vomit. Stomach contents may get sucked into the lungs, which can lead to choking or pneumonia.
- You can suffer from heart disease, stroke, high blood pressure and heart failure. Even social drinkers who binge on special occasions can sometimes experience bouts of irregular heartbeats, otherwise known as "holiday heart."
- Prolonged alcohol abuse can cause anemia and abnormal blood clotting, resulting in excessive bleeding and easy bruising. A reduced white cell count from excessive bleeding increases your susceptibility to infection.
- Because your liver's ability to remove yellow pigment is impaired, your skin appears yellow (jaundice). Liver damage causes fluid to build in the extremities (edema). Your liver will accumulate fat which can cause liver failure, coma and death.
- You experience nausea, diarrhea, vomiting, sweating & loss of appetite.
- You can suffer from arthritis and deformed joints, and can experience atrophied muscles with acute muscle pain and weakness.
- If you are a male, alcohol impairs your production of sperm and testosterone, and can lead to infertility and impotence. In females, decreased estrogen metabolism in the liver increases the amount of estrogen circulating in the body, which can contribute to menstrual irregularities and infertility.

T – 7.12a

Affects Persons Differently

Liquor

Wine

Beer

Tolerance

Many drinkers develop an ability to mask the effects alcohol has on their brain and body.

This ability, however, has NO affect on their intoxication level.

Personality

Because people have unique personalities alcohol affects everyone differently.

Alcohol can affect an individual in various ways depending upon the drinker's mood when consuming the alcohol.

Experience

The inexperienced driver is at extreme risk when alcohol is involved.

Affects Persons Differently

Liquor

Wine

Beer

Fatigue

Alcohol is a depressant. It will compound the effect of fatigue.

Medication

The chemical reaction between alcohol and other drugs can produce an effect that is much greater than that of alcohol or other drugs when taken alone.

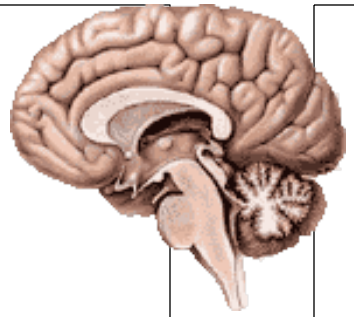
Weight

Heavier people have more blood and body fluids to dilute the alcohol. Therefore, their BAC will be lower than that of a smaller person who consumed the same volume of alcohol.

Age

The neurological development of the brain continues until a person is in their 20's. The risks of impairing memory and learning capacity can be severely affected by the use of alcohol during adolescence.

BAC Levels Affect the Brain



.01 - .05

Reduces Inhibitions

Impairs Judgment

Gives a False Sense of Confidence

Weakens Willpower

.05 - .10

Slows Reaction Time

Reduces Coordination and Balance

Affects All Driving Skills

.10 - .20

Slurred Speech

Blurred Vision

Impaired Judgment, Memory and Self-Control

.20 - .35

Physical Abilities Become Severely Impaired

Mental Confusion

Unconsciousness, Blackouts or Stupor are Common

.35 - higher

Subnormal Temperature

Little or No Reflexes

Breathing May Stop

DEATH

•NOTE: "Chugging" large amounts of alcohol in a short period of time can result in respiratory paralysis and death.

Drugs and Driving

- Perception
- Judgment
- Coordination
- Vision
- Mood

Marijuana

The active ingredient THC (delta-9-tetrahydrocannabinol) impairs

- memory and learning
- perception (sight, sound, time, touch)
- problem-solving ability
- motor coordination
- tracking ability
- concentration

More research needs to be conducted to determine marijuana's effects on brain function 8, 16 and 24 hours after smoking.

Marijuana and Driving

Marijuana Fact:

MARIJUANA AND DRIVING DO NOT MIX. USERS OFTEN HAVE DELAYED RESPONSES TO SIGHTS AND SOUNDS DRIVERS NEED TO NOTICE.

Other Types of Drugs and Driving

Over the Counter Medications That Affect Driving Ability

- Antihistamines
- Cold Medications
- Other

Prescription Medications

- Tranquilizers
- Stimulants
- Narcotics
- Blood Pressure
- Insulin