

Virginia Department of Education

Module Seven Transparencies

Driver Performance: Personal Factors

Topic 1 -- Introduction to Alcohol – Saying No

Topic 2 -- Nature of Alcohol-Related Crash Problems

Topic 3 -- Physiological and Psychological Effects of Alcohol

Topic 4 -- Effects of Alcohol and Other Drugs on the Driving Task

Topic 5 -- Dealing with Driver Fatigue

Topic 6 -- Preventing Road Rage

Provided in cooperation with the Virginia Department of Motor Vehicles

Using or Not Using?



Why do you think Virginia has a Zero Tolerance Law for drivers under age 21?

Why do some people choose not to use alcohol or other drugs?



Your Choices and Responsibilities

Having a driver's license involves more than just knowing how to drive. It involves demonstrating **responsible adult behaviors.**



Virginia's Zero Tolerance Law protect citizens from underage drinking and driving.

Responsibility:

- starts with the decisions you make;
- your ability to carefully consider the potential consequences of your choices; and
- acceptance of the financial responsibility for the harm you cause yourself or others.

Your Choices and Responsibilities

Alcohol Use – Decisions & Consequences

Short-term rewards	Short-term consequences	Long-term rewards	Long-term consequences



Costs of Drinking & Driving in VA

PROCESS	OFFENDER'S TIME & COSTS	
	TIME	CONSEQUENCES/COSTS
Traffic Stop, Field Test Arrest, Breath Test Booking	3 – 5 Hours	If juvenile, parents notified
Magistrate Reviews Incident Report (Setting Bond, Booking)	1 – 2 Hours	After booking: Immediate 7 day suspension of Driver's License
Posting Bail	Will be held till sober Minimum 4 hours	\$500 Unsecured to \$2500 Secured
Car Towed	1 – 2 Hours	\$100 Towing Fee (unless there is another sober driver in vehicle)

Source: Thomas von Hemert - Thomas Jefferson Area Community Criminal Justice Board

T – 7.2a

Costs of Drinking & Driving in VA

PROCESS	OFFENDER'S TIME & COSTS	
	TIME	CONSEQUENCES/COSTS
Return to General District Court after 7 days to retrieve Driver's License	1 – 2 Hours	Time lost from work or school
Hiring an Attorney	1 – 3 Hours meeting with counsel/retaining counsel	\$112 – Court Appointed to \$1500 - \$4000 – Private Counsel
Appearing in Court	1 – 3 Hours per Court appearance (Minimum 2 appearances)	2 days work/school missed

Source: Thomas von Hemert - Thomas Jefferson Area Community Criminal Justice Board

T – 7.2b

Costs of Drinking & Driving in VA

PROCESS	OFFENDER'S TIME & COSTS	
	TIME	CONSEQUENCES/COSTS
Paying Court Costs	License can/will be suspended depending on offense class	Court Cost = \$164 Fine = \$250 - \$1000 <u>Felony Conviction</u> Loss of Voting Rights & Right to Bear Arms
Jail Time	0 –12 Months (depends on BAC and number of previous convictions: can be mandatory)	0 - \$500 Fine .20 BAC has a mandatory 5-day jail & \$250 fine .25 BAC has a mandatory 10-day jail & \$250 fine 2 nd offense within 5 years has a mandatory 5-day jail and \$500 fine PLUS: If a juvenile is in car = \$500 fine and 5-day jail

Costs of Drinking & Driving in VA

PROCESS	TIME & COSTS	
	TIME	CONSEQUENCES/COSTS
Trip to DMV for Restricted Driver's License for 12 months (1 st offense)	1 – 2 Hours	\$120 Fee for required restricted license Driver's License marked with a BIG Red letter R for restricted
Attend Alcohol Safety Action Program (ASAP)	Minimum 20 hours ten week alcohol education course	\$350 plus \$25 per sighted drug screen as required plus any other treatment costs
Notify Insurance Co.	Must apply for SR22 on Driver's License (3-5 years)	\$1000 - \$2,000 increase in car insurance per year
Obtain Non-restricted	1 – 2 Hours at DMV	\$10 fee
Total Cost: \$5,000 - \$20,000		
The costs in time, money and lives for drinking and driving is HUGE! Remember drinking & driving is illegal at any age.		

Evaluating Impairment Involves



- Making personal decisions about alcohol and the driving task
- Analyzing the alcohol-related safety problem
- Understanding the physiological and psychological effects of alcohol on the driving task
- Studying the effects of other drugs on the driving task
- Understanding driver fatigue and the dangers of road rage



Impact of Alcohol Crashes on Virginians

Alcohol Related Facts		Virginia 2002
Alcohol-related Fatalities ALL Persons Killed	Total	375
	Drivers	237
	Passengers	100
	Pedestrians	38
Alcohol-related Injuries All Persons Injured	Total	8,465
	Drivers	5,668
	Passengers	2,498
	Pedestrians	299
Alcohol-related Fatalities Young People 15-20 Killed	Total	64
	Drivers	32
	Passengers	29
	Pedestrians	3
Alcohol-related Injuries Young People 15-20 Injured	Total	1,470
	Drivers	791
	Passengers	644
	Pedestrians	35

Virginia Statistics provided by DMV's 2002 Crash Report

Traffic Death Comparisons

ALCOHOL RELATED TRAFFIC INCIDENTS*

VA = _____



U.S. = _____



DRUG RELATED TRAFFIC INCIDENTS

VA = ?_____



U.S. = ?_____



* Crash statistics available at www.dmvnow.com and www.nhtsa.dot.gov

Underage Alcohol-Related Crashes in Virginia

	1995	2002
Under legal drinking age drivers in crashes	3082	<input type="text"/>
Percentage of all alcohol related crashes	10.04%	<input type="text"/>
Under legal drinking age licensed drivers	939,862	<input type="text"/>
Percentage of all licensed drivers	7.4%	<input type="text"/>
Is this group over or under involved?	over involved	<input type="text"/>
Involved in 10.04% of crashes but represent only 7.4% of all drivers		

Blood Alcohol Concentration Factors



Liquor



Wine

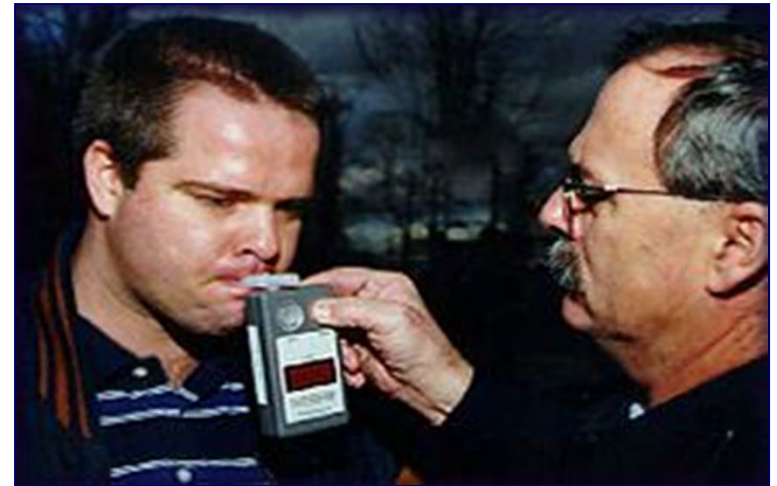


Beer

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

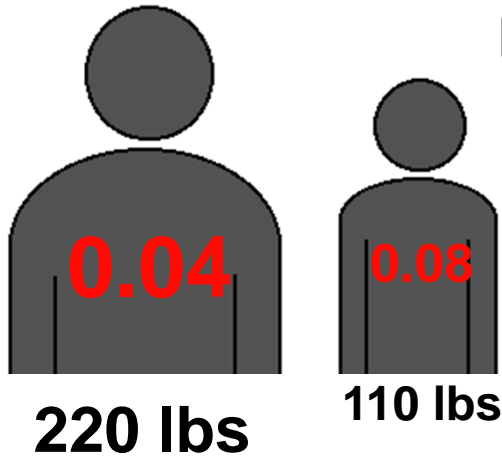


Wine



Beer

Weight



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 $\frac{1}{2}$ 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?



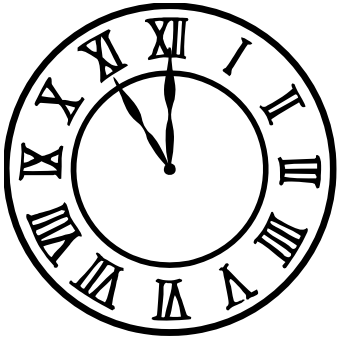
Light
Beer

		Weight			Oz. Light Beer			BAC			Oz. Light Beer			BAC		
M A L E	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						
F E M A L E	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 %.

Elimination Rate



Myth

The average person can tolerate one drink per hour without substantial impairment.

Facts

- Sobriety returns **ONLY** with time.
- Alcohol is eliminated at approximately .015 BAC per hour.

Titanic Principle

If you take in more than your system can pump out, sooner or later you'll sink!

Elimination Rate

Example

Based on 1 drink per hour for 6 hours

150 lb male

$$\text{BAC in (6 hr. x .03)} = .18$$

$$\text{BAC out (6 hr. x .015)} = .09$$

$$\text{BAC after 6 hr. (.18 - .09)} = .09 \text{ BAC remaining}$$



150 lb female

$$\text{BAC in (6 hr. x .033)} = .198$$

$$\text{BAC out (6 hr. x .015)} = .09$$

$$\text{BAC after 6 hr. (.198 - .09)} = .108 \text{ BAC remaining}$$

Elimination of Alcohol

ELIMINATION PROCESS

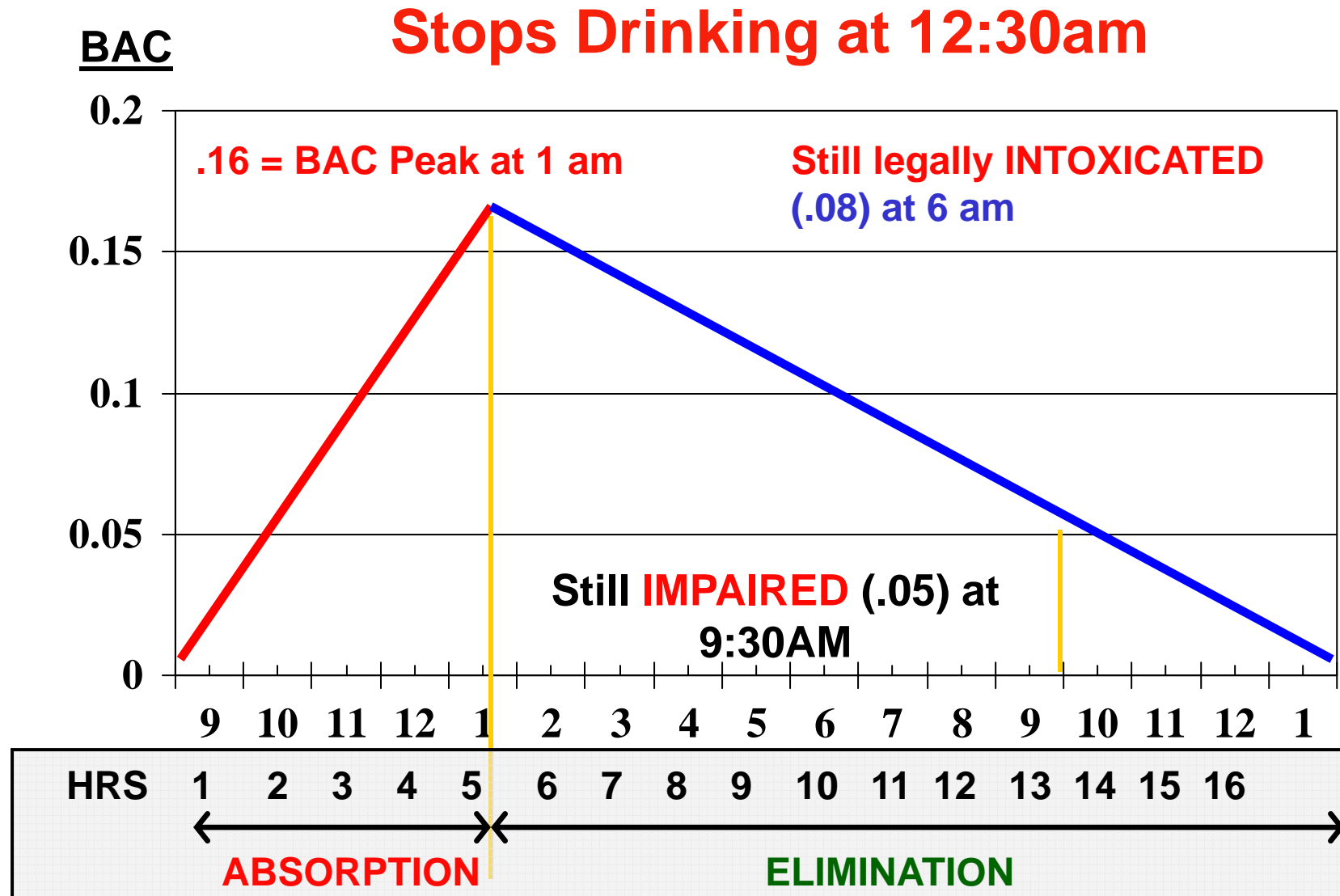
Breath
Urine
Sweat } **10%** **LIVER 90%**

**An adult male with normal liver function eliminates
about 0.015 BAC 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



Elimination Rate



Alcohol Effects & You



Liquor



Wine



Beer

*What Alcohol
Can Do:*

Brain

Lungs

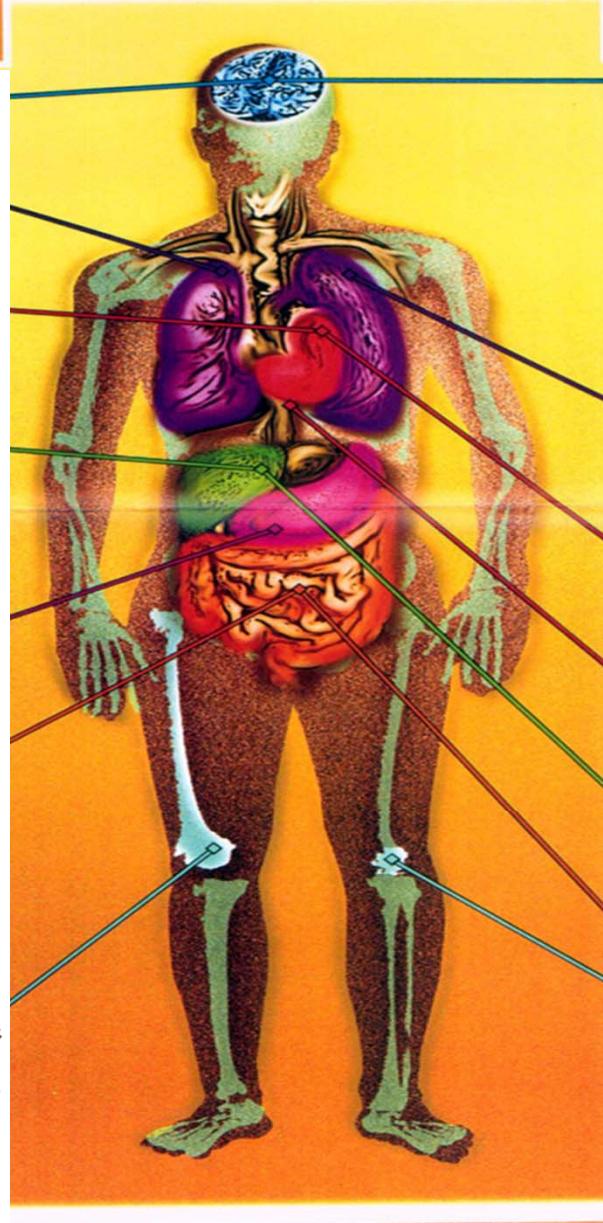
Heart

Liver

Stomach

Intestines
& Pancreas

Bones &
Muscles



*What May
Happen to You:*

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

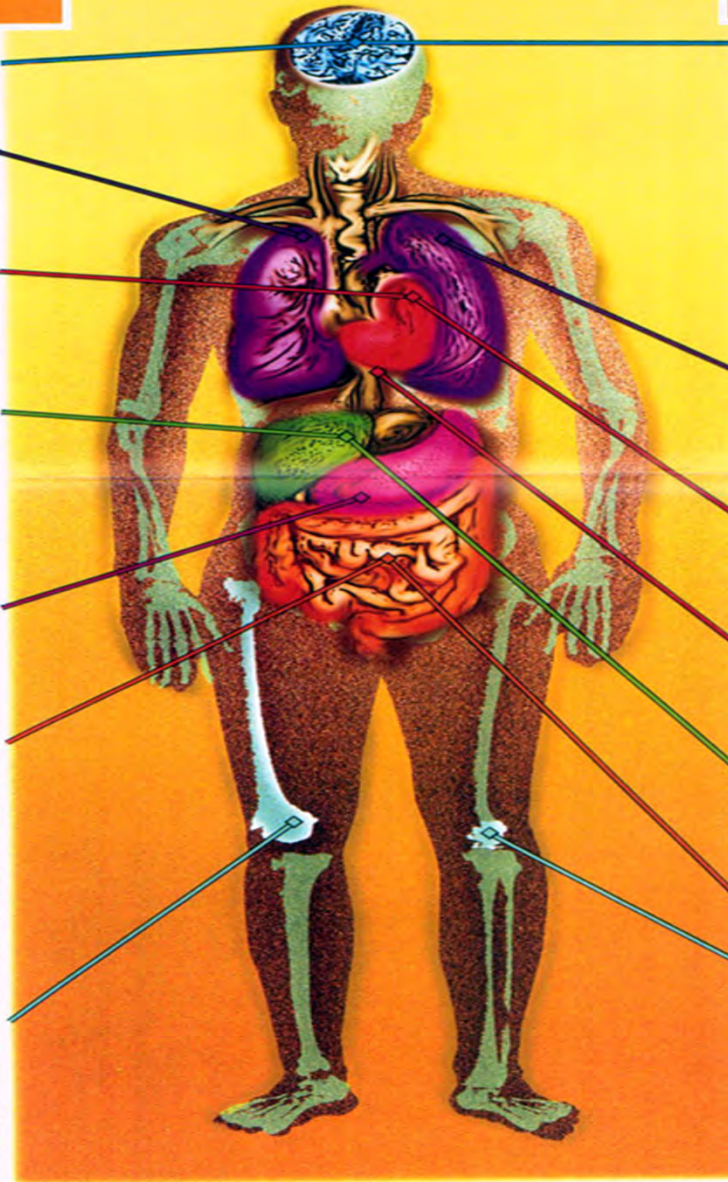
Alcohol irritates the stomach and can lead to peptic ulcers, bleeding lesions and cancer.

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.



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

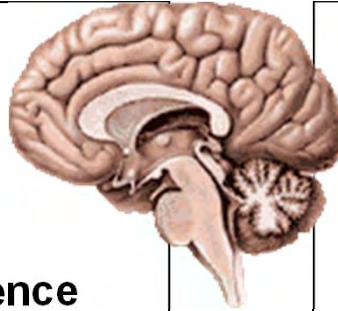
Reduces Inhibitions
Impairs Judgment
Gives a False Sense of Confidence
Weakens Willpower

.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.

Alcohol and Space Management



Searching

- Alcohol

- narrows the field of vision
- lessens visual acuity
- impedes the ability to distinguish colors
- reduces the ability to rapidly change focus from close to far
- may produce double vision by relaxing the muscles that control the eyes
- reduces the ability to judge distance accurately
- After drinking, a driver may tend to stare at the center line.



Alcohol and Space Management



Evaluating

- Alcohol

- impairs judgment
- diminishes the ability to process multiple variables
- lessens the ability to concentrate



Alcohol and Space Management

Executing

- Alcohol



- causes changes in coordination
- slows reaction time
- affects the ability to judge distance
 - a drinking driver may perceive something as further away than it is
- affects ability to judge speed
 - drinking driver may be unable to judge speed of approaching traffic



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



Definition of Fatigue

Fatigue is:

- The Body's "Downtime"
- Follows a Period of:
 - Extended mental activity
 - Extended physical activity
- Characterized by:
 - Reduced capacity for work
 - Reduced efficiency of brain function



Causes of Fatigue

- ❖ **Disruption of Circadian Rhythm**
- ❖ **Extended Physical Activity**
- ❖ **Emotional Stress**
- ❖ **Sleep Disorders**
- ❖ **Body's Natural "downtime"**
 - ❖ **Midnight to 6 a.m.**
 - ❖ **1 p.m. to 3 p.m.**



Physical Symptoms of Fatigue

- ❖ **Tired Muscles**
- ❖ **General Body Sensation of Tiredness**
- ❖ **Sleepiness**
- ❖ **Mental Dullness**



Physical Symptoms of Fatigue



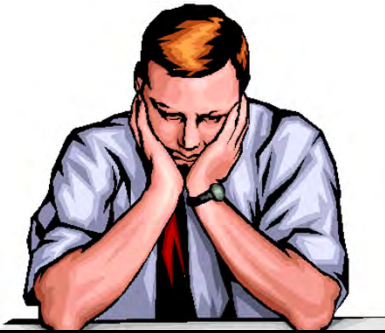
- ❖ **Localized Pain in Back of Head**
- ❖ **Pain and Soreness in Muscles**
- ❖ **Stiffness in Joints**
- ❖ **Swelling of Hands and Feet**

Mental Symptoms of Fatigue



- ❖ **Inability to Maintain Attention**
- ❖ **Impaired Memory**
- ❖ **Failure to Grasp New Ideas**
- ❖ **Difficulty/Slowness in Reasoning**

Delaying Fatigue Onset



- ❖ **Avoid** Long Drives
- ❖ **Avoid** Leaning Forward or Backward
- ❖ Keep Your Eyes Moving
- ❖ Get Plenty of Fresh Air

Delaying Fatigue Symptoms

- **Change Drivers at Regular Intervals**
- **Wear Your Safety Belt**
- **Avoid Getting Angry**
- **Adjust HVAC Properly**



Aggressive Driving/Road Rage

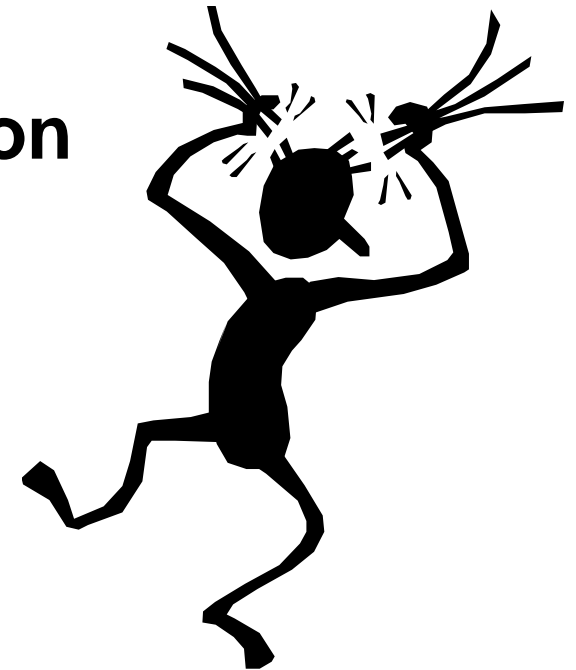
Most Crashes are NOT Accidents

- They are often the result of drivers who
 - speed;
 - tailgate;
 - run red lights;
 - weave in and out of traffic; or
 - vent frustrations or emotions in the vehicle.

Factors Leading to **Aggressive Driving/Road Rage**



- More Cars
- More Traffic Congestion
- More Frustration
- More Stress
- More Hostility
- More Violence



Factors Leading to **Aggressive Driving/Road Rage**

Did you know?

In the past 30 years in the US:

- population has increased 30%
- number of licensed vehicles has increased 87%
- vehicle miles traveled increased 130%
- **highway capacity has only increased 5%**



Factors Leading to **Aggressive Driving/** **Road Rage**

Self-Imposed Anxieties

- “I’m going to be late if I don’t hurry up.”
- “Why are these cars going so slowly?”
- “We’ll never make it.”
 - “If only I had gone a little faster, I would’ve made it.”
 - “Oh no! **Red** light!”



Three Types of Aggressive Drivers

Quiet Road-Rage:

- complaining
- rushing
- competing
- resisting

AAAAAGHH!!!

YOU'RE TOO SLOW~**MOVE!!!**



Verbal Road-Rage:

- yelling
- cussing
- staring
- honking
- insulting

What's the hold up!!!

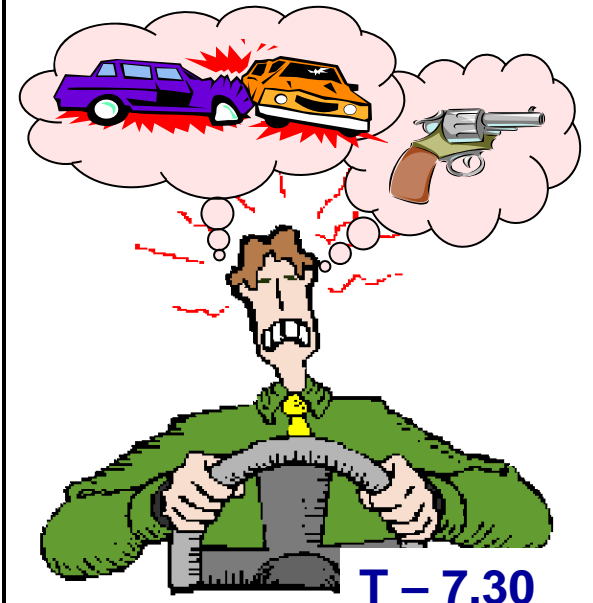
Come on, **HURRY UP**

LET'S GO!!!

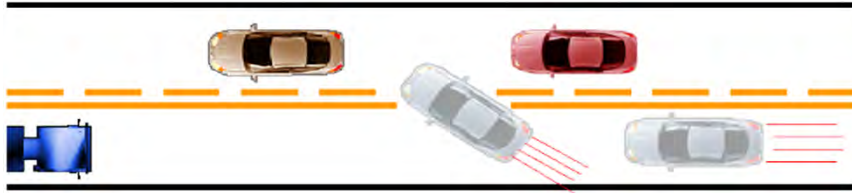


Epic Road-Rage:

- cutting off
- blocking
- chasing
- fighting
- shooting



Signs of an Aggressive Driver



- Tailgating to pressure a driver to go faster or get out of the way
- Flashing lights to signal the driver to move out of the way
- Weaving in and out of traffic
- Cutting people off
- Racing to beat a yellow light



Signs of an Aggressive Driver

- **Behaving impatiently with slower drivers**
- **Honking the horn or screaming**
- **Speeding**
- **Not coming to a complete stop at stop signs**
- **Making gestures**
- **Passing on shoulder or unpaved areas**



Other Signs May Include...



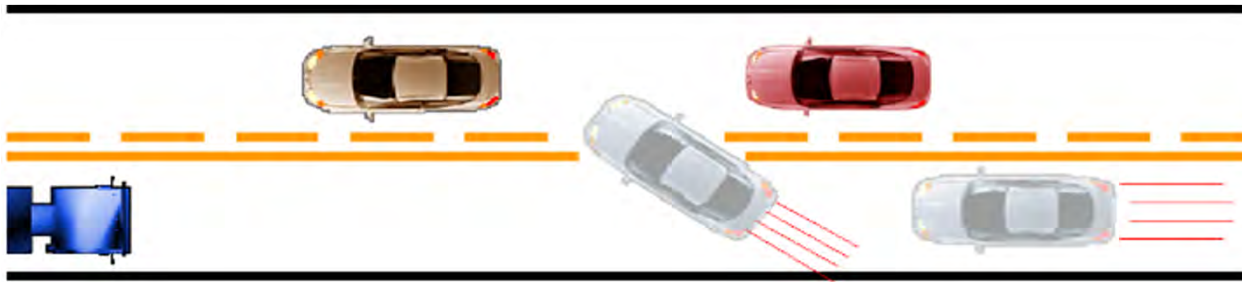
Do You Drive Aggressively?



The “Rush In” Area



- Is constant rushing and lane jumping your style?
- Do you believe OTHERS are just in your way?



- Do you ignore road signs and regulations, believing they're for other drivers?

Do You Drive Aggressively?



In “Total Aggression”

- Constantly ridiculing and criticizing other drivers to self or passengers
- Closing gap to deny entry into your lane
- Giving the “look” to show your disapproval
- Speeding past another car or revving engine

HURRY UP
LET'S GO, MOVE IT!!!



Do You Drive Aggressively?

In “Total Aggression”

- Prevent others from passing you
- Tailgating to pressure a driver to go faster or get out of your way
- Fantasizing physical violence
- Honking, yelling through the window
- Making visible insulting gestures

What are you, an IDIOT?!



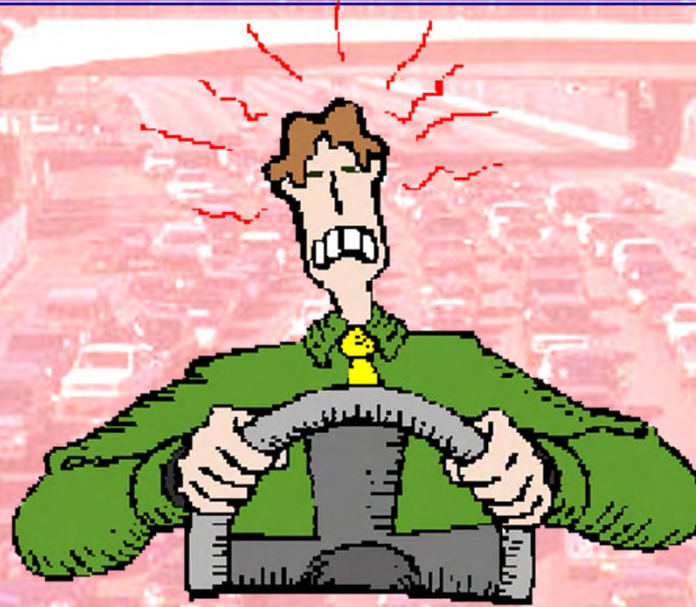
Do You Drive Aggressively?

In The “Violence” Area

- Carrying a weapon just in case...
- Deliberately bumping or ramming
- Trying to run a car off the road to punish
- Getting out of the car, beating or battering someone
- Trying to run someone down
- Thoughts of killing someone
- Shooting at another car



Preventing Road Rage



Road Rage

- A Societal Condition Where Motorists Become Violent in Reaction to Traffic Disturbances or Driver Behavior

Preventing Road Rage

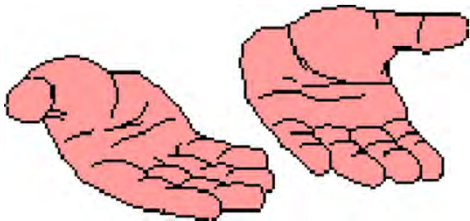
If Confronted by an Aggressive Driver

- Avoid horn use
- Don't block the passing lane
- Don't tailgate
- Keep music at a reasonable level
- Avoid eye contact
- Try to get out of the way
- Put your pride in the back seat
- Ignore gestures and refuse to return them

Preventing Road Rage

- ***Don't Respond*** -- Stay COOL. Don't react to other drivers' aggressive actions.
- ***Don't Engage*** -- Stay away from vehicles driving recklessly.
- ***Don't Up the Ante*** -- Don't take traffic problems personally.
- ***Swallow Your Pride*** -- Take a courteous and helpful attitude toward other drivers.
- ***Choose the Road "LESS Traveled"*** -- Avoid aggressive drivers by traveling less congested roadways.

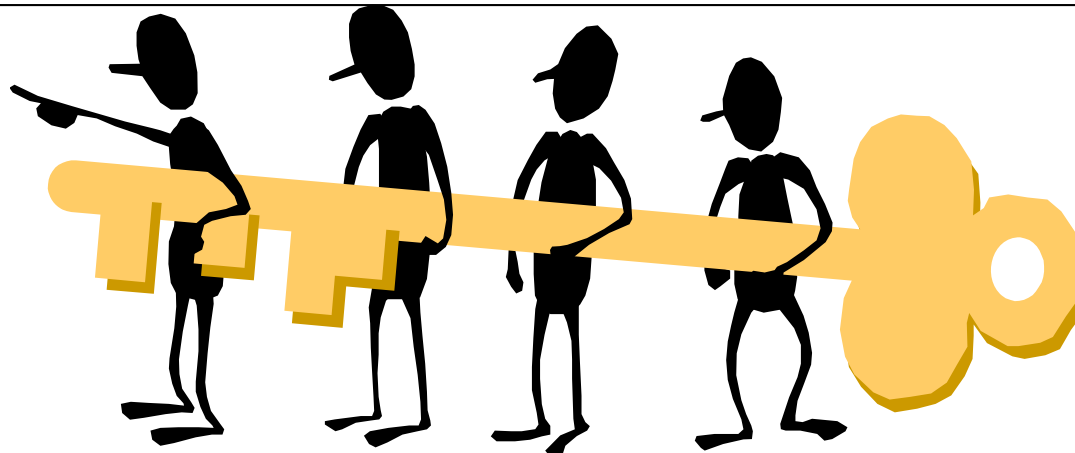
Preventing Road Rage



- ❖ ***Making Errors*** -- Expect other drivers to make mistakes.
- ❖ ***Responding to Errors*** -- Assume other drivers' mistakes are not personal and be polite and courteous even if the other driver is not.
- ❖ ***Controlling Emotions*** -- Smiles and courtesy can minimize feelings of hostility.
- ❖ ***Response to problems*** -- Tell yourself to take a few deep breaths and say: "I won't let this get to me."

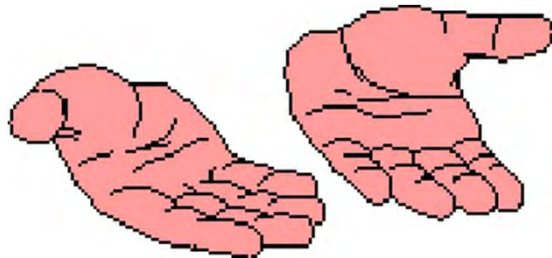
Useful Attitudes

**DRIVING IS A COOPERATIVE
VENTURE: NOT A
COMPETITIVE SPORT!**



Preventing Road Rage

How will you respond?



Positive Attitudes

**REMEMBER THAT YOU
CANNOT CONTROL
TRAFFIC, ONLY YOUR
REACTION TO IT!**