Blood Alcohol Concentration (BAC) and Binge Drinking

Part 2 of a 4 Part Series

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The legal system uses a more scientific method for determining when a person is drunk, Blood Alcohol Concentration (BAC,) the percentage of alcohol in the blood (or proportion of alcohol to blood in the body) as someone drinks.

In most states, a BAC of .10% is considered legally drunk. This means that for every 1,000 milliliters of blood, the body contains 1 milliliter of alcohol. In some states, the legal definition of intoxication is .08%, which means that for every 1000 milliliters of blood, the body contains 8/10ths of a milliliter of alcohol.

In addition, most states practice zero-tolerance laws, meaning if you are under 21 any alcohol in your system is against the law.

- The faster someone drinks, the higher the BAC is, and the more dangerous drinking becomes.
- A BAC of .37%-.40% or higher can cause death.

Growing Impairment

Following are ten snapshots of increasing drunkenness and impairment as blood alcohol concentration increases. Ranges are approximate and vary with the drinker:

1. BAC = .02 = Drinkers begin to feel moderate effects.

2. BAC = .04 = Most people begin to feel relaxed, mildly euphoric, sociable, and talkative.

3. BAC = .05 = Judgment, attention, and control are somewhat impaired. Ability to drive safely begins to be limited. Sensory-motor and finer performance are impaired. People are less able to make rational decisions about their capabilities (for example, about driving.)

4. BAC = .08 = this is the legal level for intoxication in some states. There is a definite impairment of muscle coordination and driving skills.

5. BAC = .10 = this is legally drunk in most states. There is a clear deterioration of reaction time and control.

6. BAC = .12-.15 = Vomiting usually occurs, unless this level is reached slowly or a person has developed a tolerance to alcohol. Drinkers are drowsy.

Drinkers display emotional instability, loss of critical judgment, impairment of perception, memory, and comprehension.

Lack of sensor-motor coordination and impaired balance are typical. Decreased sensory responses and increased reaction times develop. The vision is significantly impaired, including limited ability to see detail, peripheral vision, and slower glare recovery.

7. BAC = .15 = this blood-alcohol level means the equivalent of 1/2 pint of whiskey is circulating in the blood stream.

8. BAC = .18-.25 = Drinkers are disoriented, confused, dizzy, and have exaggerated emotional states. Vision is disturbed, as is perception of color, form, motion, and dimensions.

Drinkers have increased pain threshold and lack of muscular coordination. Drinkers stagger or lose the ability to walk and have slurred speech. Apathy and lethargy are typical.

9. BAC = .25-.30 = Drinkers display general inertia, near total loss of motor functions, little response to stimuli, inability to stand or walk, vomiting, and incontinence. Drinkers may lose consciousness or fall into a stupor.

10. BAC = .30-.50 = Symptoms are complete unconsciousness, depressed or absent reflexes, subnormal body temperature, incontinence, and impairment of circulation and respiration.

Death may occur at .37% or higher. BACs of .45% and higher are fatal to nearly all individuals.

Gender Inequality

Women become intoxicated more quickly than men, even when body weights are the same. There are three likely explanations for this fact.

First, soon after consumption, alcohol rapidly spreads throughout the water in a drinker’s body, and men’s bodies have a greater percentage of water by volume. If a woman drinks the same amount as a man, the effect is similar to pouring the same amount of alcohol into a smaller pail of water.

Women also have lower levels of activity in the alcohol-metabolizing enzyme, *alcohol dehydrogenase*, in the stomach. This means that more alcohol is metabolized in the stomachs of men before being absorbed into the bloodstream than in the stomachs of women. The end result is that more alcohol passes directly into the bloodstream of women.

Finally, as a woman’s hormone levels vary during the course of her menstrual cycle, her blood alcohol concentration can vary dramatically with the same amount of alcohol intake.

How to Sober Up

The body can metabolize (process or break down) 1/2 an ounce (or 14 grams) of *ethanol* per hour. Recall that a "standard" drink contains 12 grams of ethanol. That means the average person can metabolize about one standard drink per hour. For every drink a person consumes, he or she must let an hour pass without taking in any more alcohol before being sober.

Some people think that they can sober up quickly by eating, drinking black coffee, sleeping, taking a cold shower, or running around the block. The fact is that none of these strategies sober

up a drunk person faster. Nothing sobers someone up except time -- lots of time. Nothing the person does during that time will speed up the process. All that matters is that several hours go by. Stay tuned as next week we will discuss the short and long term effects of binge drinking.