

GENERAL PRACTICE Alcohol and Drug Awareness



LESSON WORKBOOK



DENNIS O'SULLIVAN






The American Athletic Institute (AAI) is a sport consulting firm that does research on Olympic-caliber athletes. They have worked with organizations ranging from youth hockey teams to the Boston Celtics to the U.S. Navy Seals. Their main focus is determining how drugs and alcohol affect athletic performance.

Dennis O'Sullivan spent 6 years playing in the NFL, mostly with the New York Jets. He also worked as the New York City Director of Government Affairs for the NY State Office of Alcoholism and Substance Abuse Services.

How does alcohol affect athletic performance?

Alcohol will affect power, speed, endurance, hand-eye coordination, reaction time, heart and lung function, reflexes, judgment, the ability to focus and many other areas important to athletic performance.


There are many misconceptions about alcohol. One is that alcohol only affects the athlete when he or she is drunk or hungover. However, alcohol's effects last much longer after the physical side effects have subsided. Studies have shown that for up to 96 hours after drinking, hormones are diminished. This is important because hormones affect many things such as muscle growth and repair, mental toughness, pain tolerance, fatigue perception, training effect and recovery.



HORMONES

Heavy drinking caused massive suppression of testosterone between 1.5 and 96 hours (4 days later). (AAI 2005)

You are at practice but your hormones are not...



Diminished hormones cause the athlete to feel tired and feel more pain. The athlete will not build power, speed and endurance as effectively as he or she should. In short, the athlete loses both the mental and physical edge.

One prominent study conducted by the American Athletic Institute is their analysis of enzymes. The AAI took a winter sport athlete and conducted a muscle biopsy. They then analyzed the athlete's slow, intermediate and fast twitch muscle fibers. This provided 12 base numbers for analysis. The athlete then endured a two week training session that focused on power and speed training. After 2 weeks, the AAI conducted a second muscle biopsy on the athlete. 10 of the 12 enzymes increased with some doubling and even tripling. The training was designed to make the athlete bigger and stronger. This is exactly what happened.

The athlete began a second 2 week training session immediately after. The AAI attempted to keep the same parameters with the same eating and sleeping habits and patterns. The major exception was the athlete drank alcohol once a week, on the 4th and 10th days. 4 days after the last drink, they took another muscle biopsy. This time 9 out of 12 enzymes had decreased with some going back to where they were one month prior. This essentially means that drinking ONCE can negate 2 weeks worth of quality training.

The injury rate for drinkers is around 54% and the appetite for non-drinkers is about 23%. Someone that drinks is twice as likely to get hurt as someone that does not drink. Dennis can personally attest to this.

What is testosterone?
Androstenedione is a type of steroid which is designed to increase the amount of muscle-building testosterone in the body. Here's a look at how that process works.
Testosterone is a hormone produced in order to signal changes within the body including muscle growth, hair growth and sex drive.

What happens when muscles grow?
1. MUSCLE FIBERS ARE BROKEN DOWN BY EXERCISE
2. TESTOSTERONE REACHES THE MUSCLE CELLS THROUGH THE BLOODSTREAM
3. EXERCISE MAKES CELLS FROM LARGER, BIGGER TESTOSTEROLE
Testosterone plays a particularly important role in the growth of muscles. Released by the body during exercise, it helps muscle cells rebuild.

Muscle Growth/Repair
Counters stress
Mental toughness
Pain tolerance
Fatigue perception
TRAINING EFFECT
RECOVERY

1. BUILDING PROTEIN CELLS
TESTOSTERONE mRNA
CELL RECEPTOR
PROTEIN
MUSCLE CELL
Testosterone urges the RNA, or message center, in muscle cells to create more protein, the building block of cells. This leads to bigger cells.

2. NO MORE BRAKES
Normal Process
CORTISONE
TESTOSTERONE
With extra testosterone
Testosterone also counteracts the effects of cortisone, the body's natural anti-inflammatory substance. More testosterone means less cortisone.

3. IN THE BRAIN
Testosterone is also known to make people more aggressive. Increased aggression can translate to harder workouts and a higher tolerance for pain. All of which can mean faster muscle growth.


HORMONES

How can you measure how alcohol negatively affects performance?

The AAI tracked 60 Olympic-caliber athletes (runners, high jumpers and swimmers). These particular sports were picked because there are no ball or object variables involved; the pool, track and jumping pits do not change. The AAI tracked all performances and drinking occasions of these athletes. They found that performances the day after they had been drinking the athletes performances' declined by approximately 11.4%.

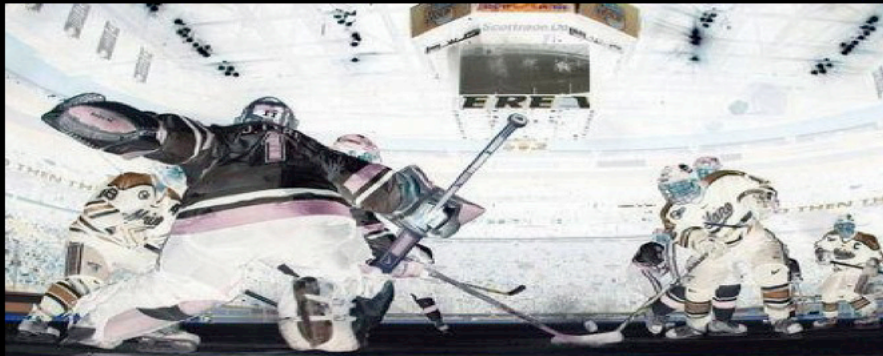
Keep in mind these were Olympic-caliber athletes. The losses of a college or high school athlete might be substantially greater than 11.4%.

How does marijuana affect athletic performance?



PRE TEST RESTING VALUES

Fiber Type	HexoKinase	Phosphofructokinase	Citrate Synthase	Cartininepalmitoyl-Transferase
Enzyme Activity				
I (SLOW)	1.6	20	23	0.6
II (FAST)	0.6	96	10	0.1
IIA (INTERMEDIATE)	1.5	72	35	0.7



ALCOHOL AND ATHLETE
 A Comparative Case Study of Enzymatic Activity, Training Effect and Alcohol Ingestion on an Elite Level Athlete
 John Greig Underwood American Athletic Institute

Marijuana affects athletic performance in many ways. THC is the chemical component in marijuana. It's what gets the smoker high and causes the damage. Marijuana today is about 10 times more dangerous than it was 35 years ago because of THC levels. In the 1970s, THC levels were between 1 – 4 % and today these levels are between 24 – 40 %.

THC collects in the brain and affects functions such as vision, memory, movement, coordination, reflexes and judgment. Marijuana and, specifically, THC can stay in your system for up to 60 days.



Does alcohol affect females differently than males?

Yes... and the difference is quite dramatic. Many factors affect how an individual reacts and/or processes alcohol. These include: height, weight, genetics, body fat composition and gender. Alcohol passes through the digestive tract and is dispersed in the water in the body. The more water available, the more diluted the alcohol. Men, in general, weigh more than women.

Women, in general, have less water and more fat in their bodies than men. Therefore, a woman's brain and other organs are exposed to more alcohol and the resultant toxic byproducts. Women also have smaller quantities of the protective enzyme alcohol dehydrogenase that breaks down alcohol in the stomach. The result is women absorb about 30% more alcohol into their bloodstreams than men do.

Energy drinks are becoming more and more popular. Are these beverages something the coach should be concerned with?

Yes... Energy drinks are very high in caffeine. Caffeine is a drug that can boost the heart rate and blood pressure, dehydrate the body and prevent sleep. Children that start using energy drinks and caffeinated beverages at a young age can learn that these products alter the way they feel. Early caffeine use is linked to drug and alcohol abuse as well as eating disorders.

Some USA Hockey coaches work with athletes as young as 7 and 8 years of age. Is there a different approach that those coaches should take when trying to discuss drugs and alcohol with younger players?

Alcohol and drug prevention/education specialists have reviewed all of the information supplied in this module. All materials are considered appropriate for all age groups. Although coaches should feel comfortable sharing this information with players they must do so with care and respect for the audience. As with all other chapter covered, the coach must use age-appropriate language. Coaches/Parents must help young players understand the differences between medicine and illicit drugs. While medicine is meant to help our bodies, illicit drugs (or mood-altering substances) are meant to make the user feel different. Although medicine is meant to help our bodies it can also be misused and abused.

Want to learn more? Check out...

www.americanathleticinstitute.org/index.html

