

Social Trends of Olympians

and their effect on mental and physical performance



2012 ASPC Americas Continental Forum
Toronto, CAN

John Underwood USA





PRESENTER JOHN UNDERWOOD

A former NCAA All-American, International-level distance runner and World Masters Champion, John has coached or advised more than two dozen Olympians including World and Olympic Champions. He is a noted expert in recovery, brain body connection. He has appeared as a guest commentator for ABC Wide World of Sports for Olympic Drug Scandals. John has worked with nearly all sport federations including the NCAA, NHL, NBA, NFL, the U.S. Olympic Committee, Sport Canada and the International Olympic Committee. John is Human Performance Consultant to the US Navy SEALs





Sport Institute of Finland





Lake Placid



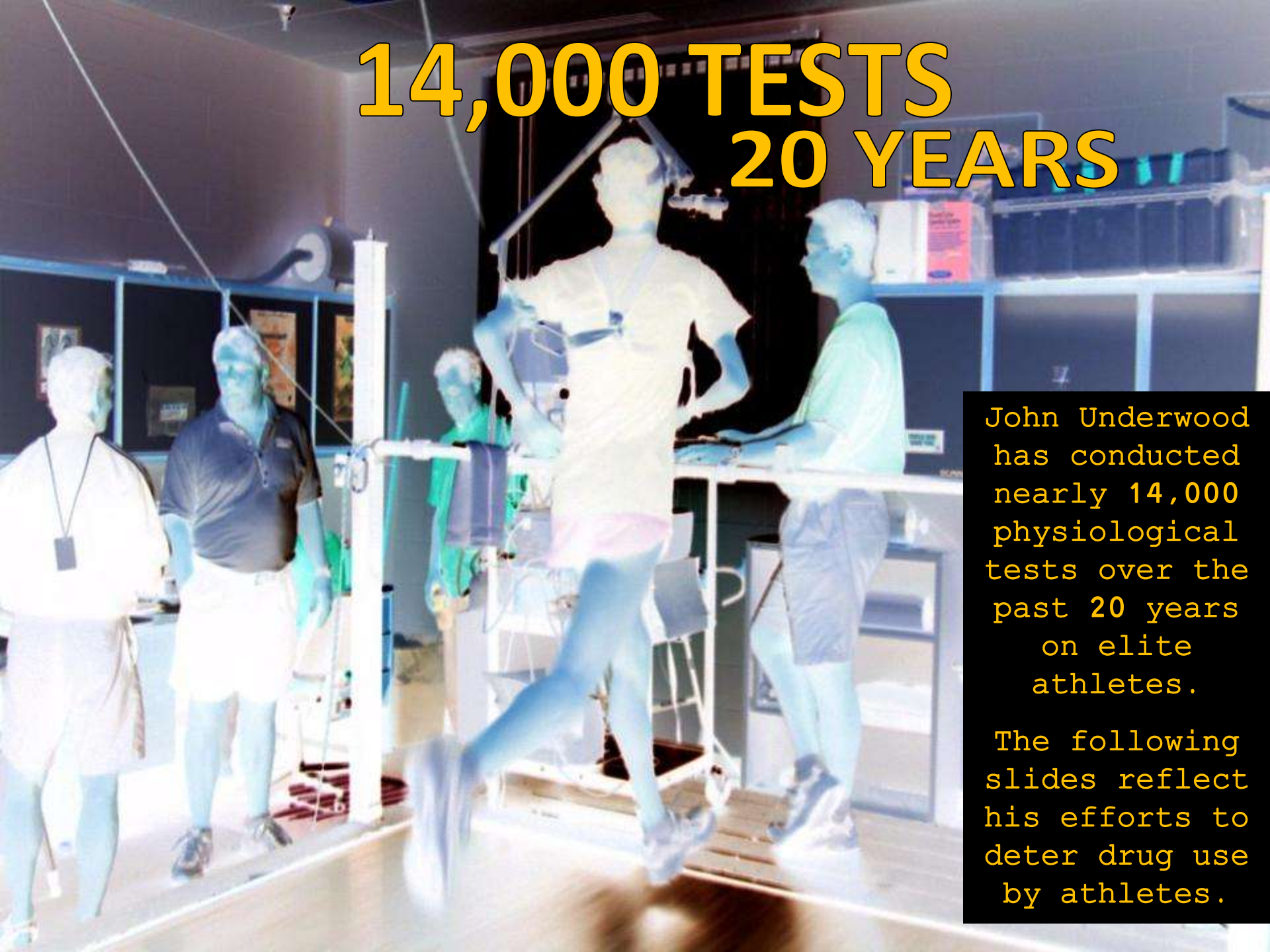


USOC Lab

Lake Placid, NY



14,000 TESTS 20 YEARS



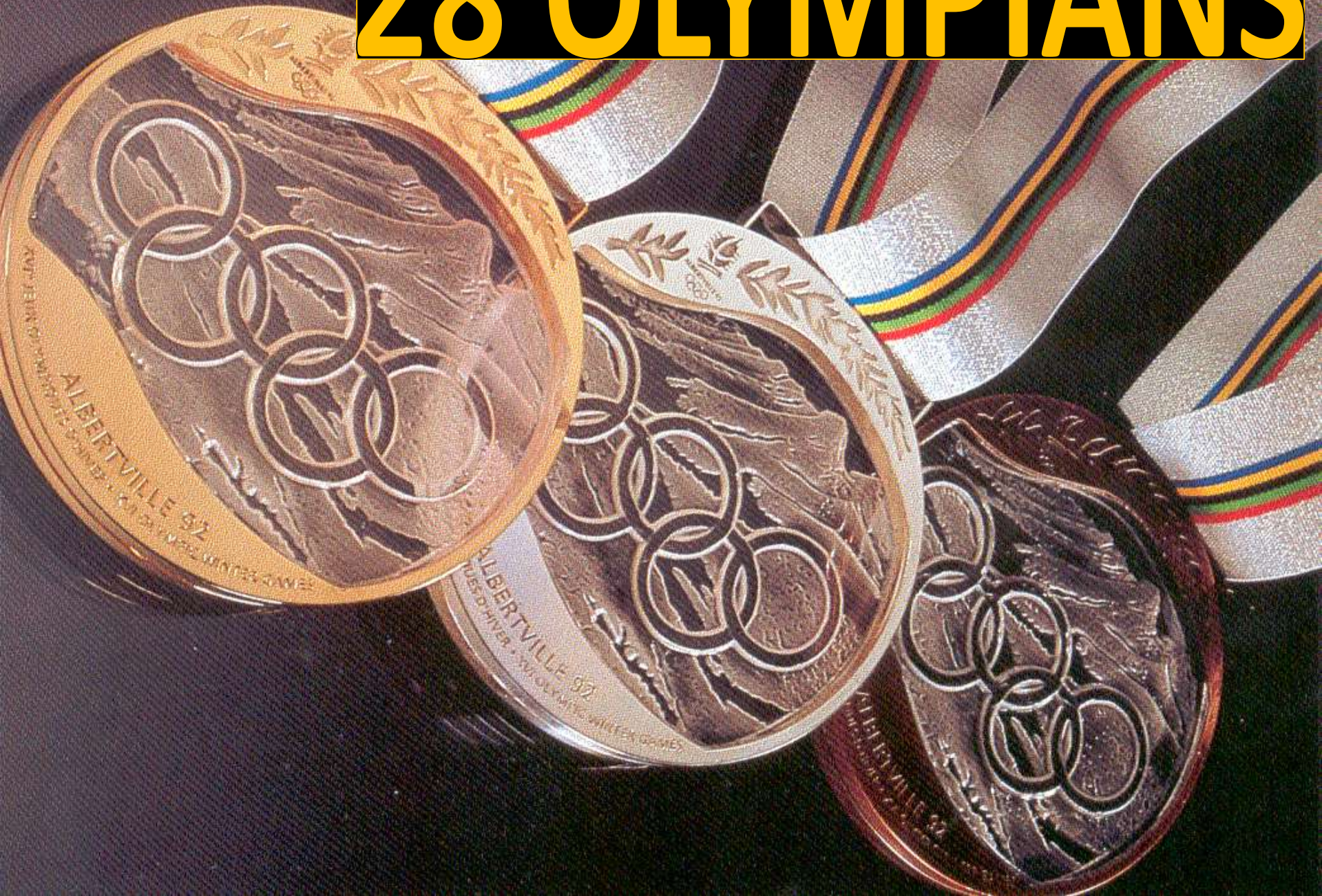
John Underwood has conducted nearly 14,000 physiological tests over the past 20 years on elite athletes.

The following slides reflect his efforts to deter drug use by athletes.

Laboratory Testing



28 OLYMPIANS



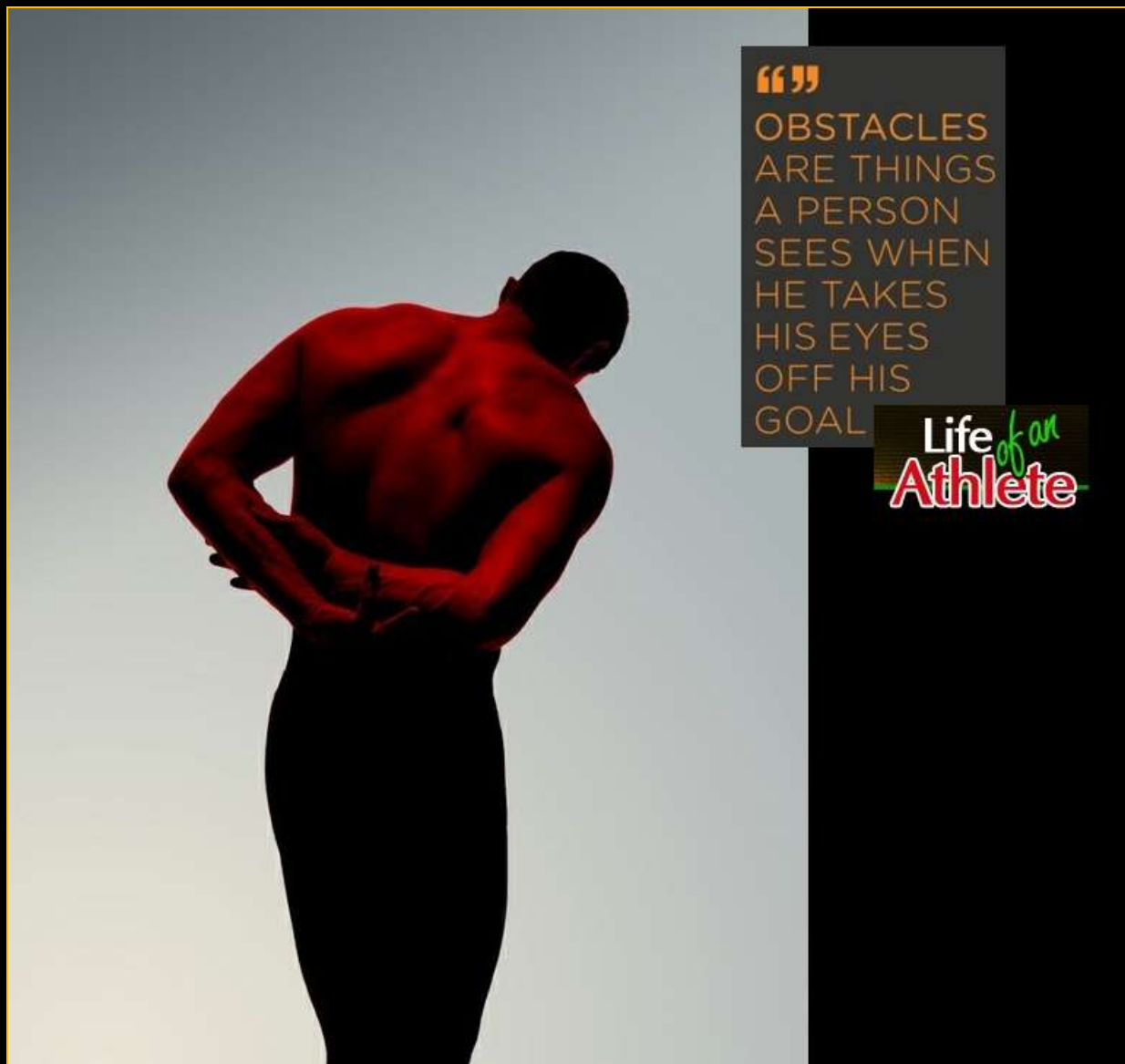
UNITED STATES NAVY SEALS

Human Performance Consultant



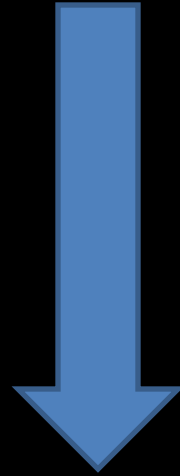
PURE PERFORMANCE

Lifestyle matters... Lifestyle counts

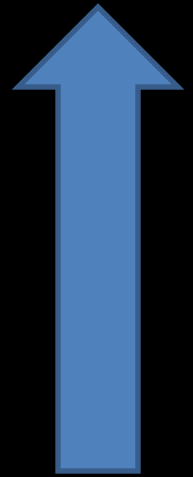


1%





DEDICATION
MOTIVATION
FOCUS
DISCIPLINE
CHARACTER



Modernization has affected factors in athlete development which are clearly not conducive to optimal mental and physical performance...

Training Recovery Performance



facebook.

LIFE AS WE LIVE IT

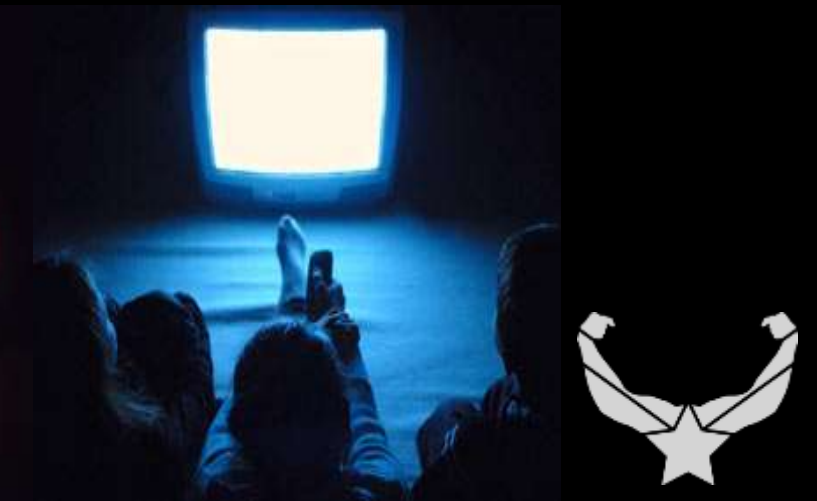


The lifestyle of this century has created conflicts and dilemmas that greatly reduce the effectiveness of top level athletes to train, recover and perform consistently at or near their best.



6:35
Time to train

ping





CHAMPION
ATHLETE
PROGRAMS

ATHLETE
LIFESTYLE
EDUCATIONAL
MODULES



Lifestyle
Strikes
Back

of Canada

coaches

du coach

PLAN

Volume 100 / Fall

Vol. 10 No. 4 | \$5.00

www.coachesofcanada.com



Sleep

Now Clearly a Predictor of Performance

John Underwood, President & Founder, American Athlete Institute

When you question the brain and central nervous system play the most significant role in optimal physical performance, every movement originates from brain CNS impulses. For an elite athlete, the CNS controls every aspect of performance potential, including function of skills, biomechanical exact movements, the timing sequence of muscles during activity, reflexes and reaction and cognitive intellectual physiological functions, including both the central system (heart and lungs) and the peripheral system (muscles). The most significant factor in the brain and CNS functioning at an optimal level is that it is rested. This has been documented throughout decades of studies on reflexes, reaction and many other variables which measure CNS readiness. Recent studies connecting on sleep and rest as a factor in optimal physical performance have proved conclusively that sleep is clearly a predictor of performance in any skill based sport.



"The problem of social drug use by athletes at any age or level of sport is unacceptable. It has gone unchecked and unfronted for far too long."



Social drug use among athletes is prevalent and the problem is complex. Athletes may be more likely to abuse alcohol than their non-athlete counterparts and are more likely to suffer behavioral and psychosocial consequences as a result of their drug use. They are also more prone to heavy episodic drinking (HED) (five or more drinks).

For decades, the media have regularly reported incidents involving high level athletes and their use of alcohol and marijuana. Although more athletes have demonstrated that treatment and rehabilitation can be successful, too often, alcohol use among athletes made in tandem or with negative behavioral issues. Discussion centered around performance-debilitating effects of social drugs have been limited to

athletes who end up in legal trouble or injury or death. Little effort has been made to impact athletes choosing concerning social drug use.

Unfortunately, the consumption of alcohol use begins today with teenage athletes, particularly to athletes who eventually progress to abusing alcohol through chronic excessive use (HED) (five or more drinks at one sitting for men and women). Many junior coaches have had an unfortunate amount of experience with team cohesion and athletic relationships divided by alcohol use, resulting in less than optimal performance due to decreased interest and disinterested team commitment. Others have had to deal with tragedies such as arrests, accidents and other alcohol related injuries and deaths.

Alcohol and athletes at a glance: Below is a recap of points made on the nature and magnitude of alcohol use among junior and elite athletes and how best to approach the problem.

- An increasing number of junior and elite athletes abuse HED (heavy drink), with fewer athletes reporting moderate intake. Female and male athletes drink at the same rates. HED

THE PARTY IS OVER



rates (five or more drinks) are nearly the same.

- Athletes drink alcohol as frequently and as intensely as non-athletes, with the difference between male athletes and non-athletes greater than that between female athletes and non-athletes. Athletes in contact sports report greater alcohol use. Athletes in team sports report greater use than individual sports.
- Drinking usually starts by middle or high school, most often by junior high school.
- Drinking rates only continue to rise over time, i.e., up and up and up.
- The physiological effects of alcohol are closely related to intermittent use with regard to least training effect and diminished athletic performance.
- Additional issues from alcohol use by athletes is behavioral, legal, academic, and social, all of which can lead to sport eligibility and participation problems. Therefore, education and prevention efforts should focus not only on the physiological negative impact, but also on the academic, behavioral, legal, social, and sports-participation consequences of alcohol use.

HighSchool TODAY

New Mexico's 'Life of an Athlete'

Warns About Alcohol Dangers

Legal Issues
Proprietary discrimination in school sports programs

Athletic Facilities
Curb appeal important at athletic venues

Sports Medicine
Concussion in sports: don't target about 11 players

AWARENESS





SLEEP

The effect of sleep on high level mental and physical performance



STRESS

The effect of stress on high level mental and physical performance

SOCIAL DRUGS

The effect of social drugs on high level mental and physical performance





RECOVERY



Physiological Considerations for Recovery in Elite Hockey

John Underwood Director American Athletic Institute

EDUCATION FOR OLYMPIANS

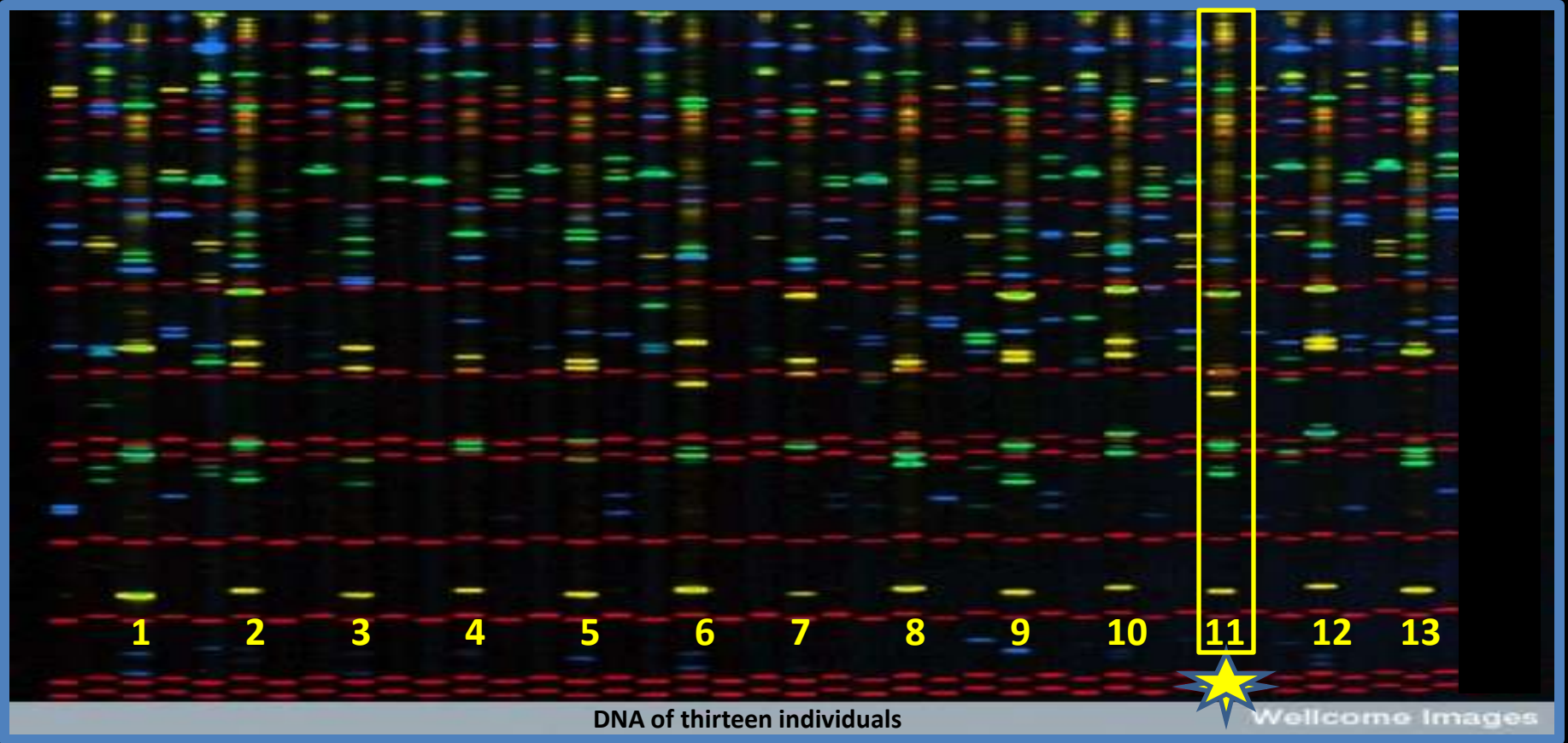
**BE A BETTER
ATHLETE.**
Life of an Athlete

If we do not teach athletes to live an optimal lifestyle
They will still make one up!

PUREPERFORMANCE

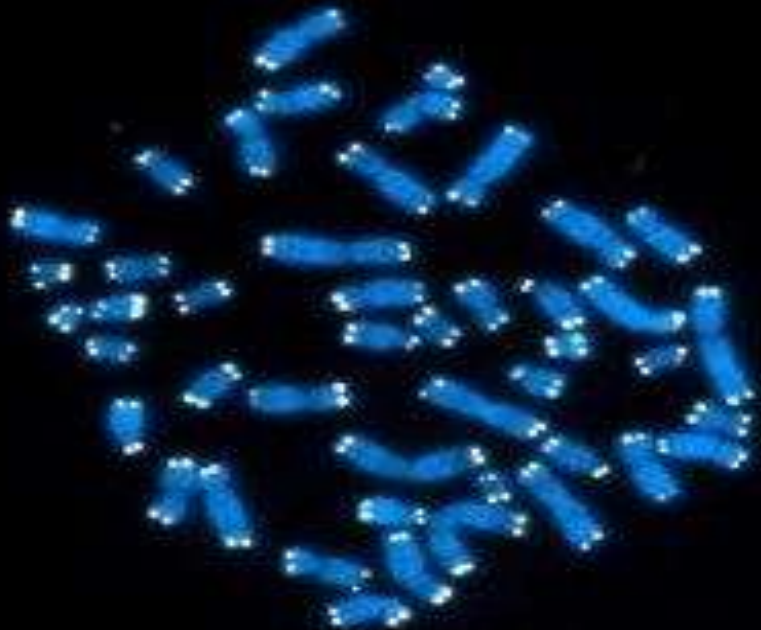


ALL THAT MAKES YOU



8%

TALENT



TALENT

Takes you to the crossroad of opportunity... it's the rest of the journey that makes a champion!

Life *of an*
Athlete

No amount of talent will overcome a lifestyle that is in conflict with elite athletic performance...



SOCIAL ISSUES 2012

STRESS

TIME MANAGEMENT

SLEEP/CNS FATIGUE

RECOVERY

DIET/NUTRITION

ADVANCED TECHNOLOGY

SOCIAL DRUG USE

PRESCRIPTION DRUG USE

SUPPLEMENTS



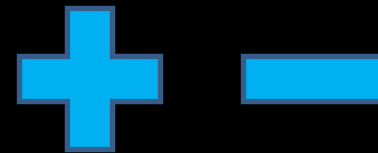
It's not just what you are willing to give...
It's what you are willing to give up!



What factors affect mental and physical performance?



In sport we spend most of our time looking at positives and ignore to a great extent the negatives...





Blood glucose up
Muscles Fueled
Hydrated
Body systems rested
CNS rested
Hormones up



FACTORS

ALL SYSTEMS GO





Poor Diet
Poor Sleep
Stress
CNS Overstimulation
Social Drug Use
Poor Recovery
Poor Training Methods

— FACTORS

ALL SYSTEMS NO





TRAINING

POOR
RECOVERY

Too much (VOLUME)

Too hard (INTENSITY)

SICK

INJURED

MENTAL/PSYCHOLOGICAL

PRETENDING that you care

LIFESTYLE (MOST COMMON)



Performance Factors

LIFESTYLE

Inseason



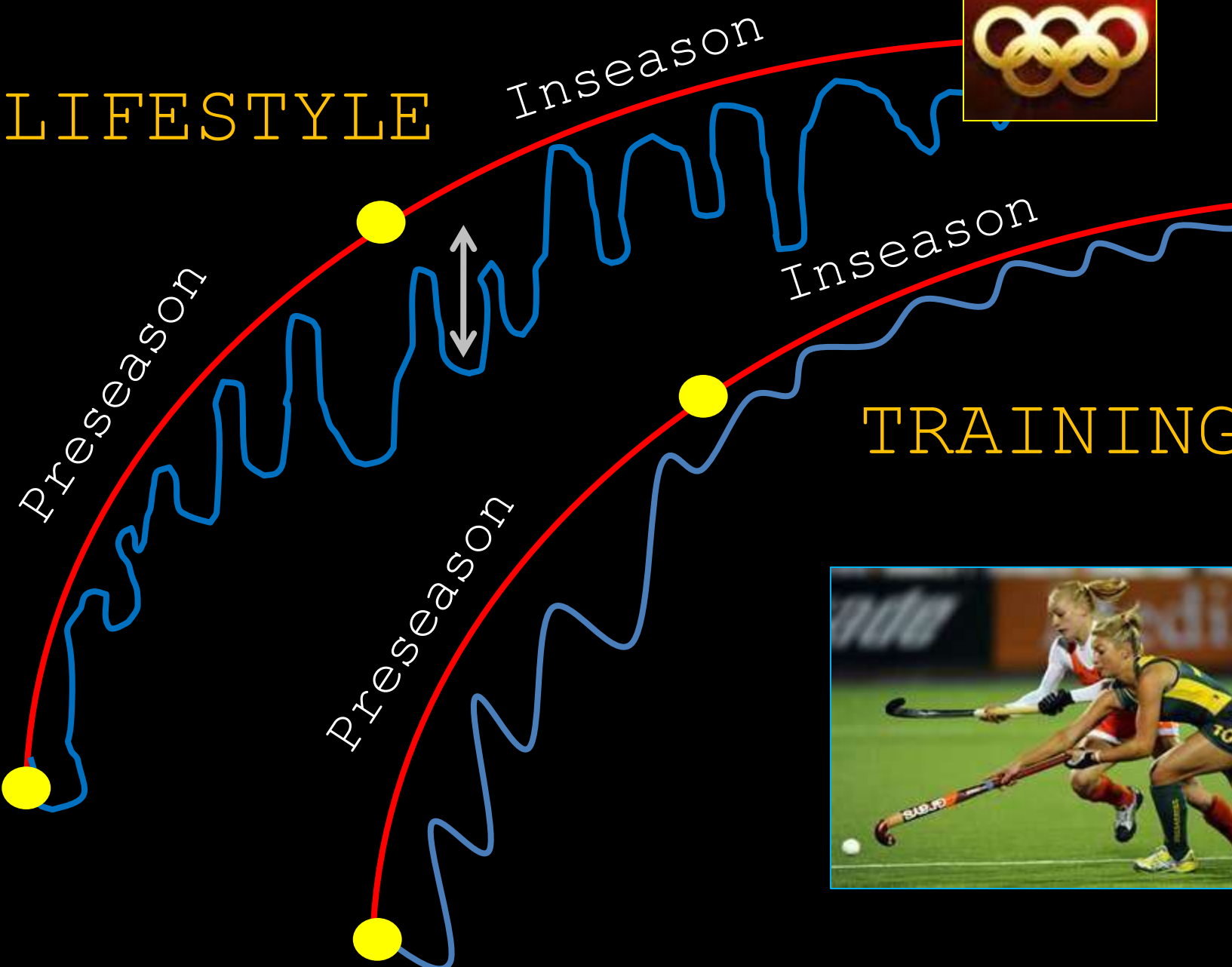
Inseason



Preseason

Preseason

TRAINING



4 years
1460 days
35,040 hours

OLYMPIC TIME

Time management

Every day matters
Every day counts



The single largest factor in
athletic development is time... Matveev USSR





SAT
23:59 PM

Everyone gets 24 hours ...
its how you use them that matters

The human body can adapt to less time
but there are serious deficits in mental
and physical performance...



OPEN
24 HOURS



ATHLETE TIME

1-3 WORKOUTS PER DAY

4-6 HOURS BETWEEN WORKOUTS

24 HOURS FOR FULL RECOVERY

1 HOUR MAX FOR HIGH INTENSITY



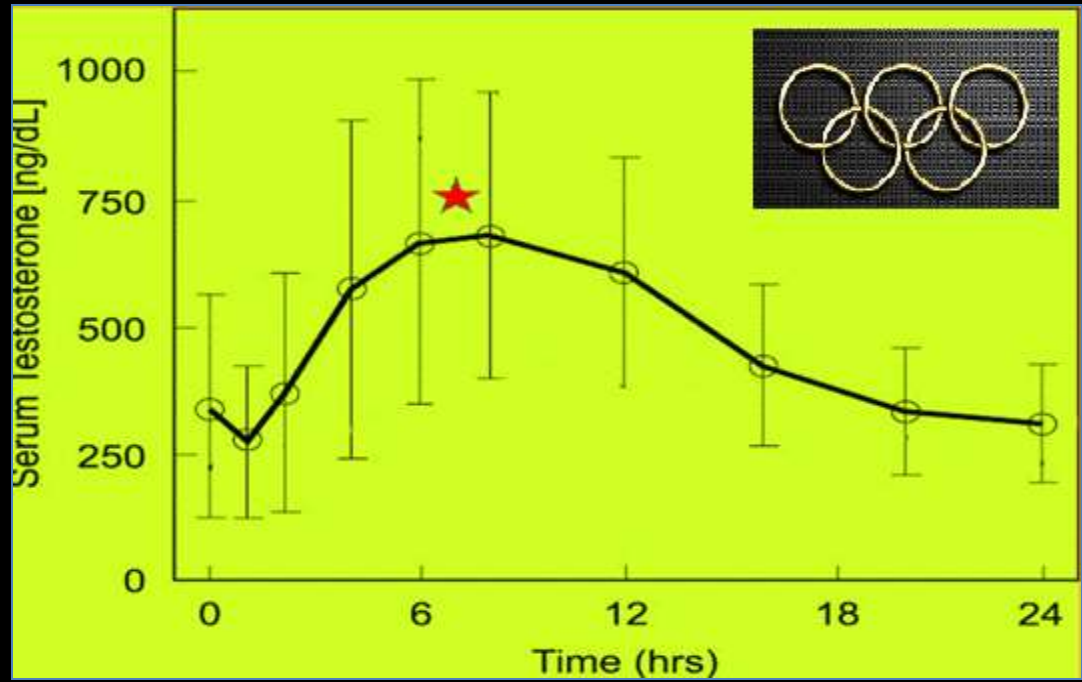
It is now necessary to monitor athlete time management with them and for them due to the societal influences that are affecting development.



Get up and go train...

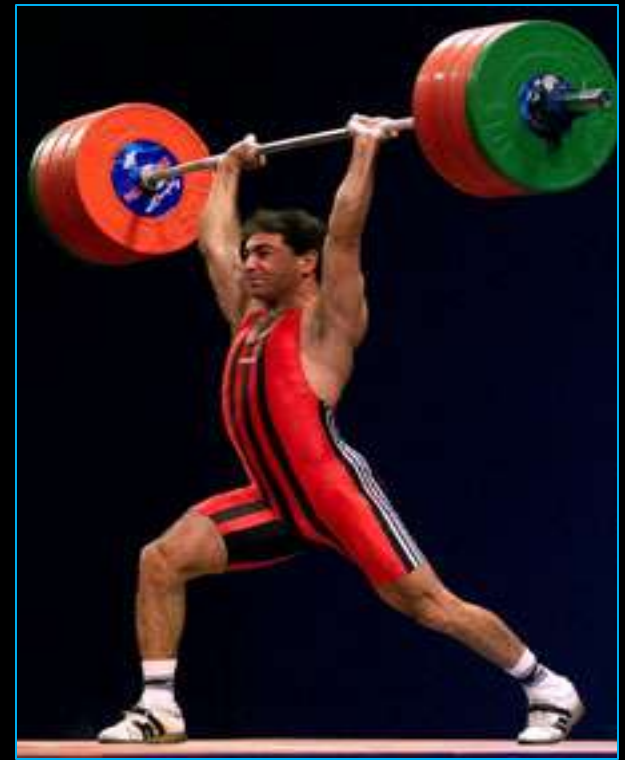
5:01

Life of an Athlete



We know training , training effect and recovery are optimal early in day..





The brain seems to be able to build up energy deficits or energy reserves over several days and will function at that level.

CNS READINESS



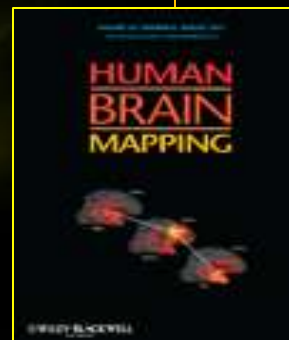


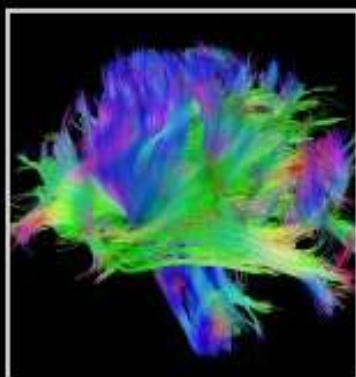
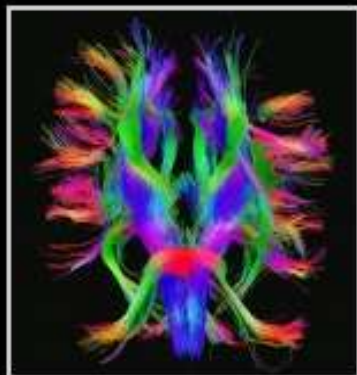
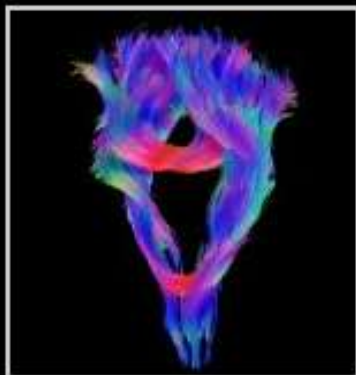
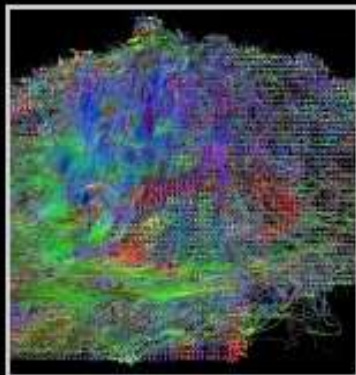
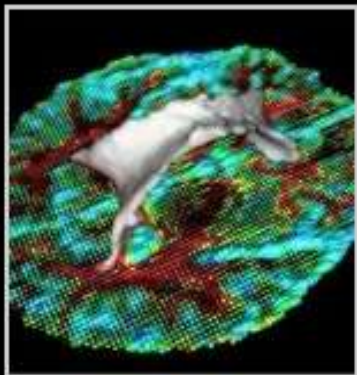
The single biggest factor in
optimal performance

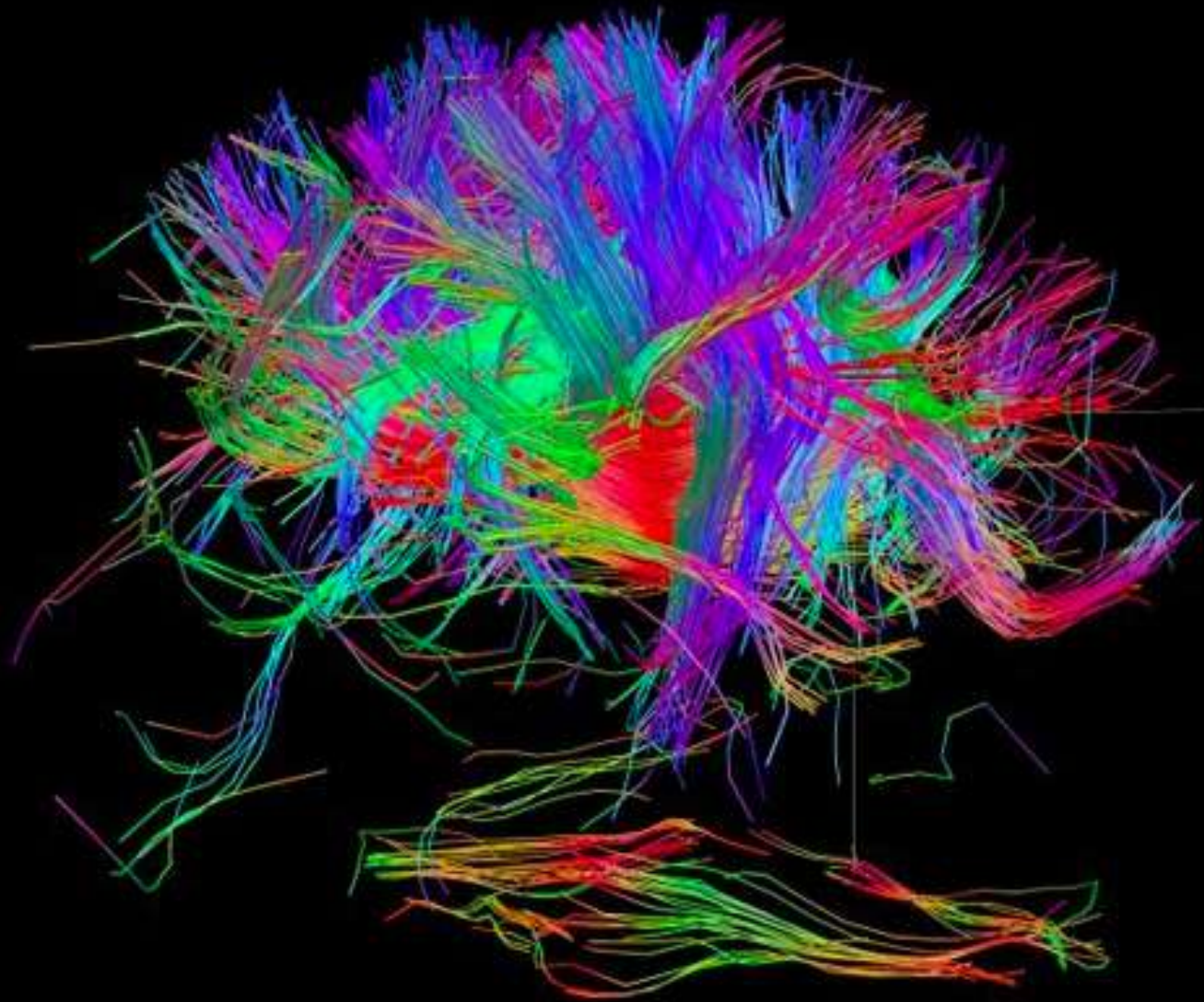
#1

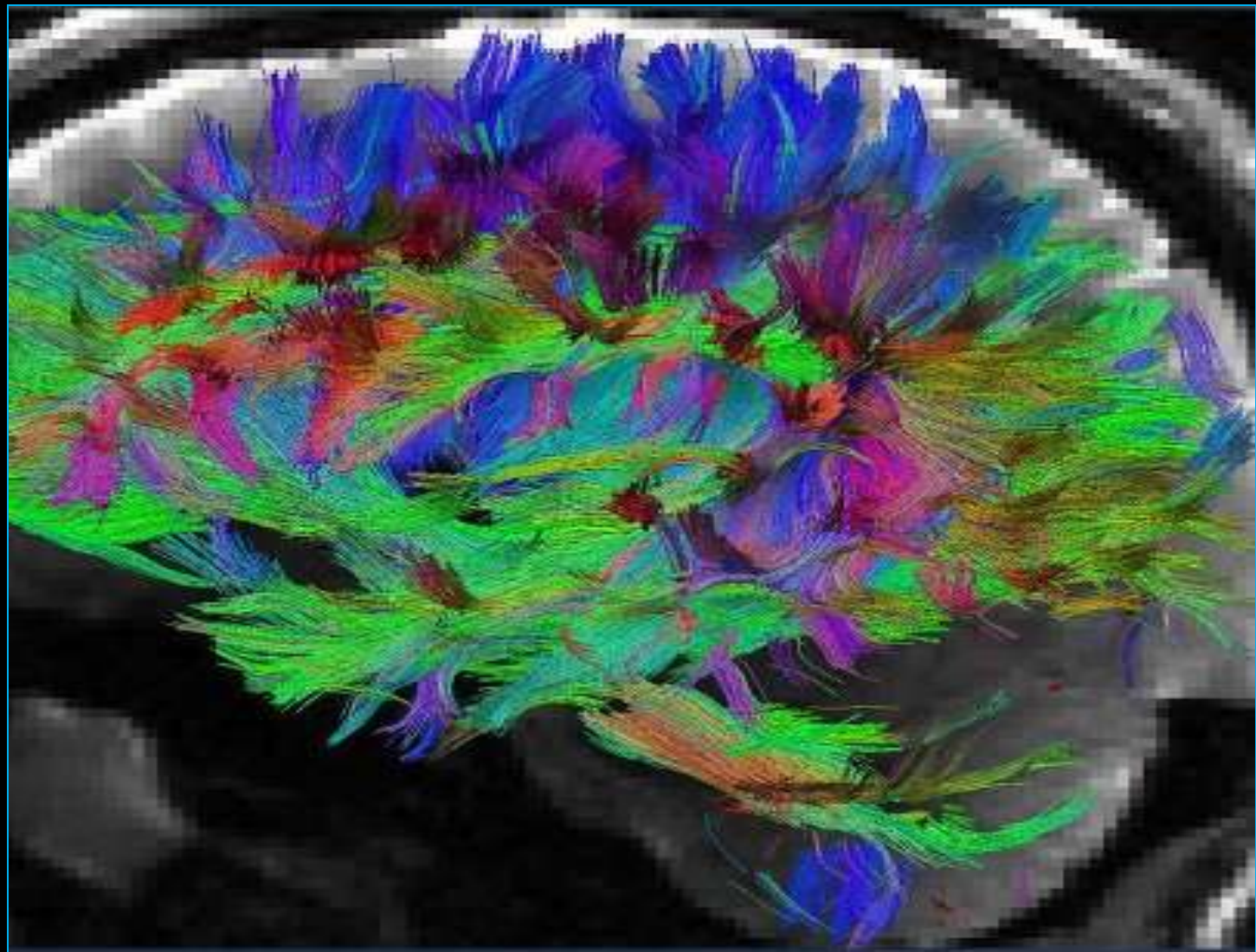
CNS READINESS

Human
Connectome
Project











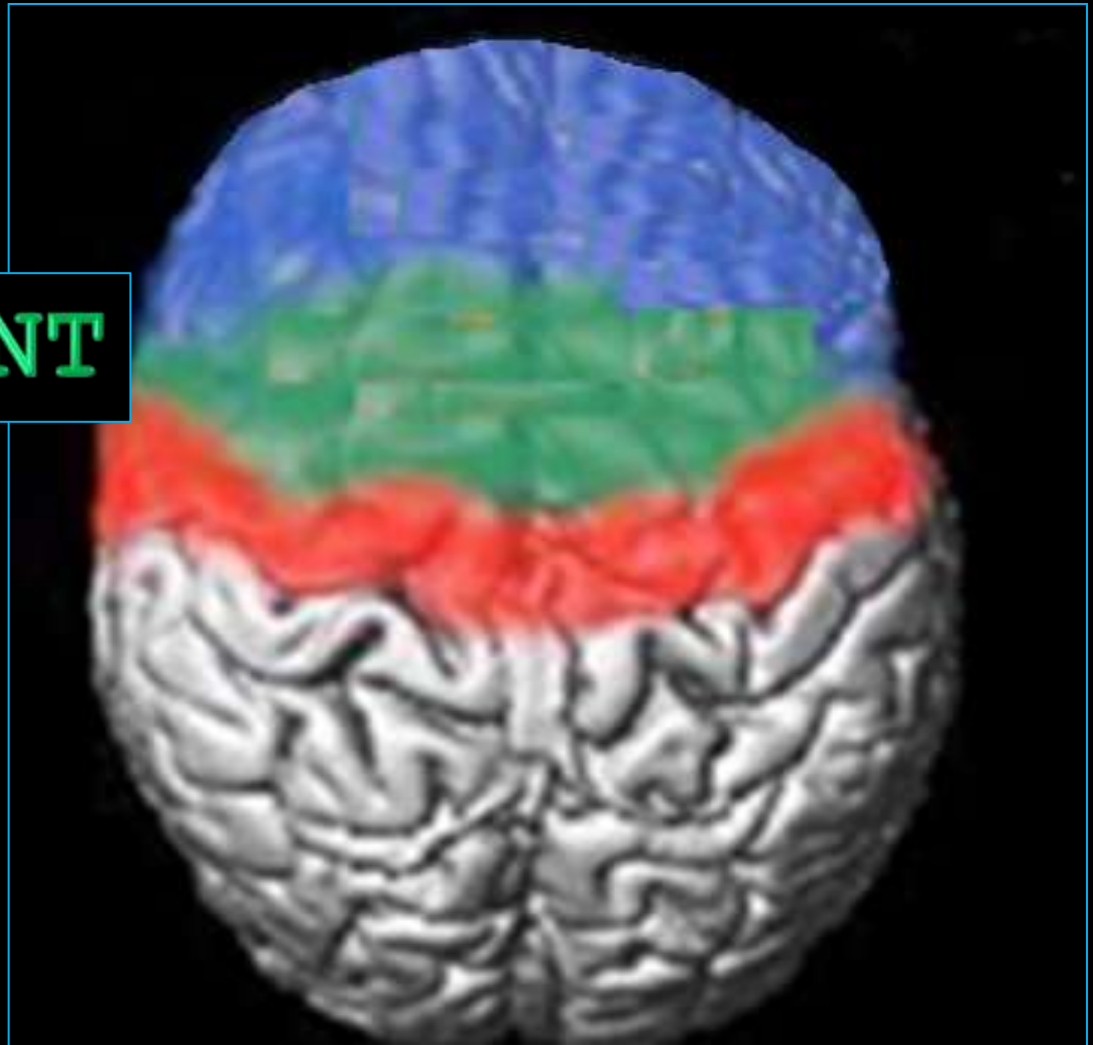
The total surface area of 100 billion neurons is equivalent to four (4) full size football fields.



THINKING

PRE-MOVEMENT

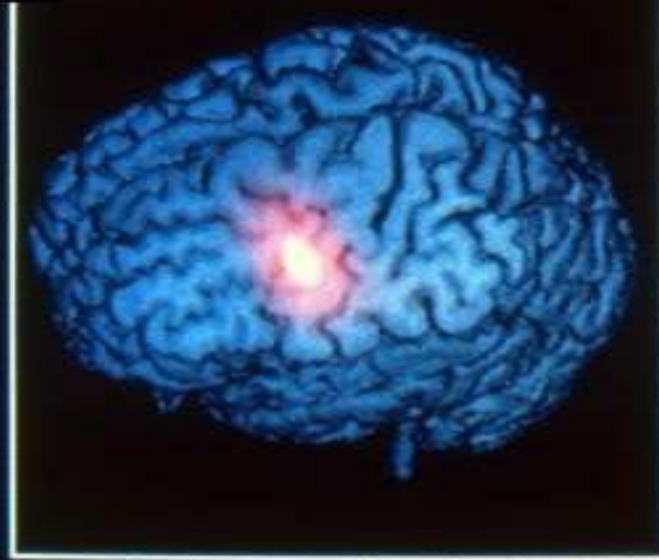
MOVEMENT



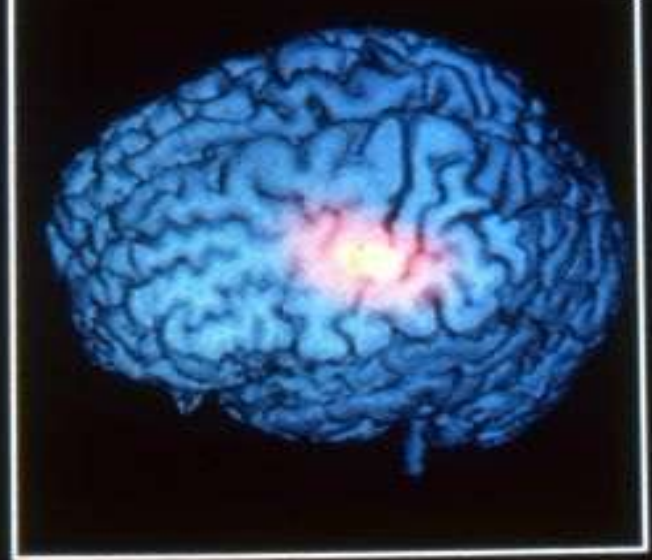
Brain and Movement



PRE MOVEMENT



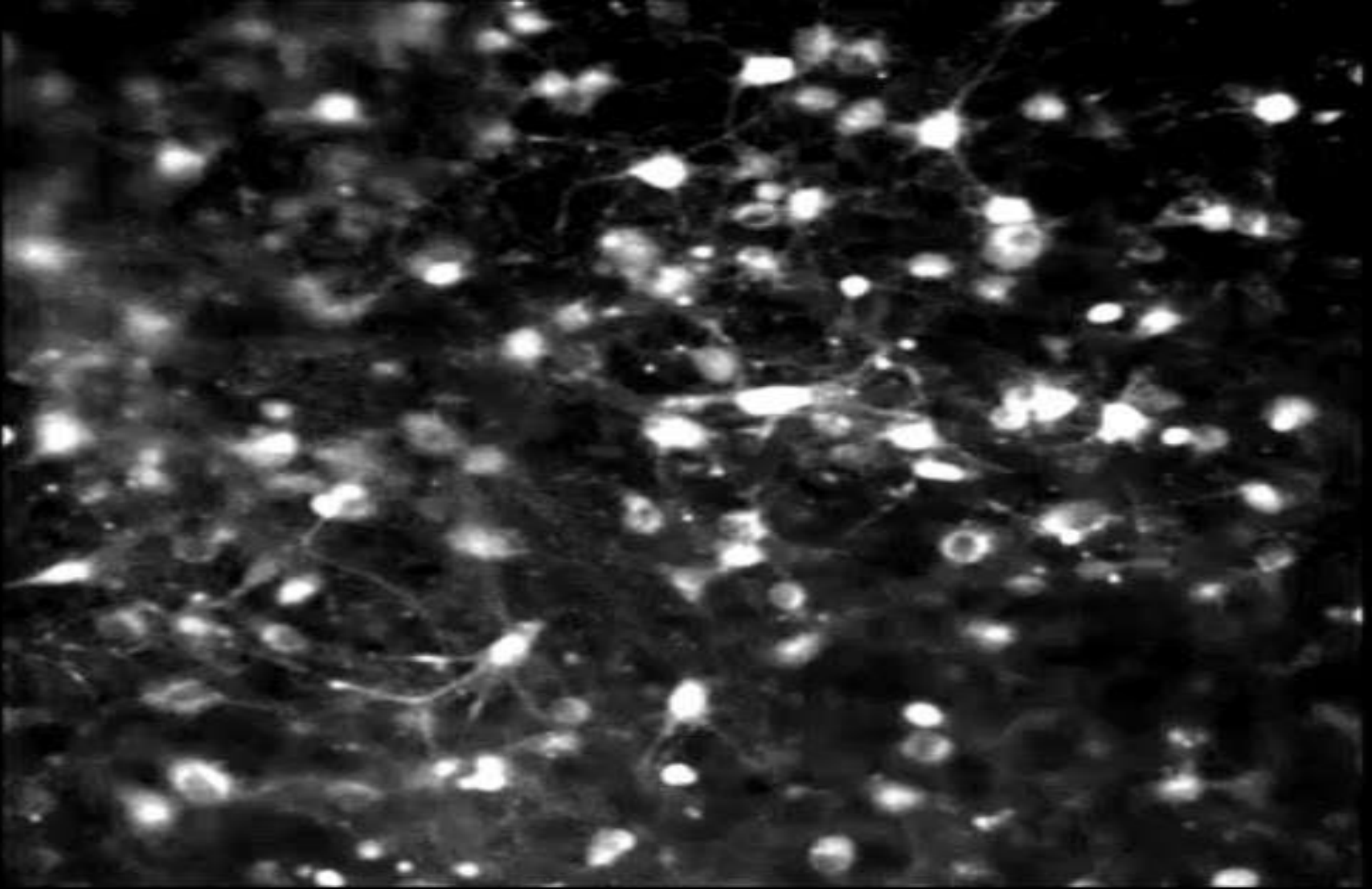
MOVEMENT



Two computer images of the human brain (side view), depicting brain to hand nerve control. At left, milliseconds before a patient starts moving their right index finger, nerve cells in the pre movement motor area of the brain (pink) send movement commands to the muscle. At right actual movement area transmitting impulse to muscles.

Physical Movements





Neuronal activity during physical activity

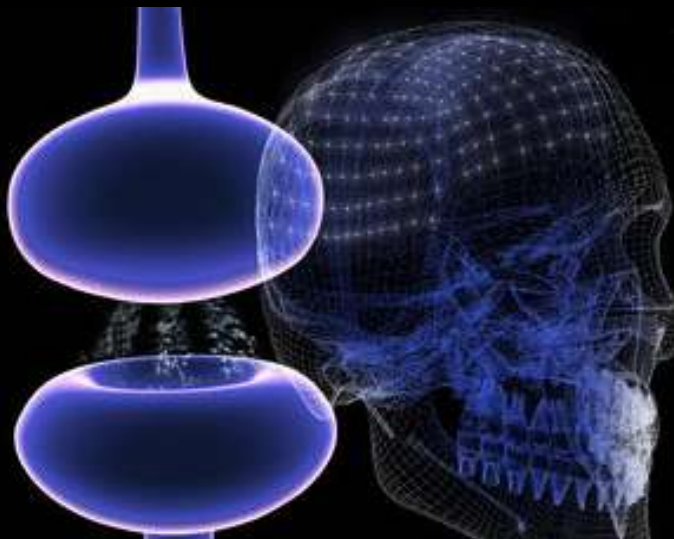
FIRESTORM

Reaction Time best indicator
of CNS Recovery/Readiness



Sending Signals





OMEGAWAVE 800

ATHLETE READINESS GROUP ANALYSIS ATHLETE ANALYSIS

Sports/Group: Football

Coach: Select ...

Athlete: Athlete Sample

CREATE NEW ATHLETE

Testing Date: Thu Mar 20 2008 4:28 PM

COLLECT DATA

Sensorimotor

Sample Athlete (32) Football John Doe
Thursday, March 20, 2008 4:28:15 PM

Current Functional State of the Sensorimotor Processes Shows the Following:
Sensorimotor center's tone is low.
The central nervous system's ability to produce an adequate response is satisfactory.
Low stability of the neurological processes that provide the psychomotor components of a reaction.
Reaction rate is low (0.188 sec.)

Parameters

Parameter	Value
Mean value of reaction time (sec.)	0.188
System's functional level index	4.0
Reaction stability index	1.1
Functional potential index	2.7
Error (short time is less than 500ms)	5
Error (short time is more than 400ms)	0

Errors committed

Reaction Rate

omegaWAVE

SENSORY MOTOR

.186 Sec.



Reaction time ELITE .186

Normal Humans



. 215 - .362 Sec.



TEST FINISHED

some people will find that the last score, when the dot flashed up big was their quickest reaction time. this generally means that the rest of the time, you were not using your 'startle' reflex to react quickly.

your average reaction time was 0.186
...that's fast!

times - seconds

0.168

0.211

0.167

0.204

0.183

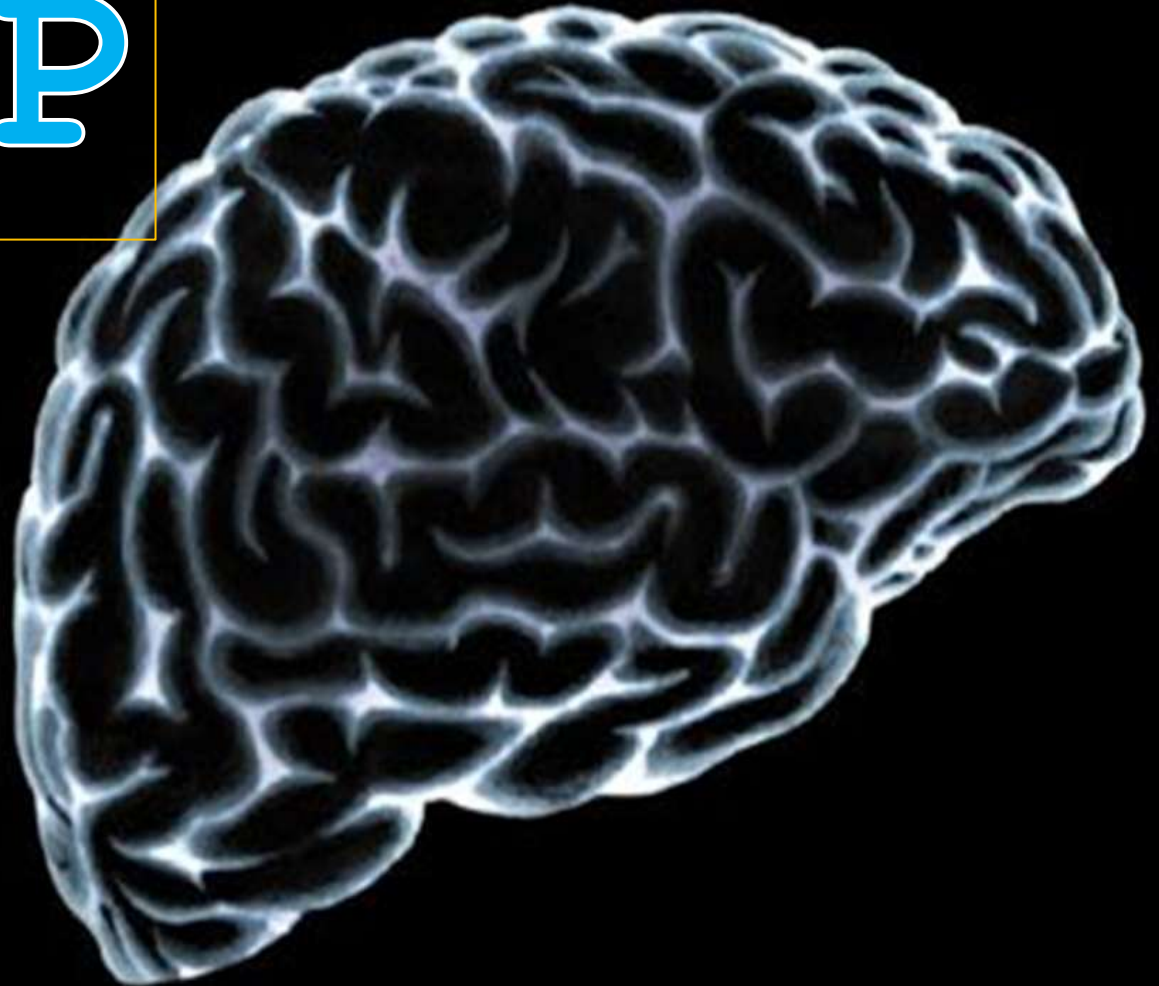
average 0.186

back

Reaction Timing Test



SLEEP



The Importance of SLEEP
in Mental and Physical Performance

REACT

Twenty four elite athletes
reaction time to visual
stimulus rested:

. 186 Sec.

Twenty four elite athletes reaction
time no sleep overnight:

. 246 Sec.



**WORKOUT IN
THE MORNING**
BEFORE YOUR BRAIN FIGURES
OUT WHAT YOU'RE DOING

Fatigued
Forget it



The body and all physiological systems must be rested and restored in order for training effect to take place. Any disruptions to the recovery process leaves the body unable to respond anabolically. The net outcome is at best a flatline. Come ready to train...

DON'T WASTE YOUR TIME



Lifestyle Strikes Back



Sleep

Now Clearly a Predictor
of Performance

John Underwood, President & Founder, American Athletic Institute

Without any question the brain and central nervous system play the most significant role in optimal physical performance. Every movement emanates from brain CNS impulses. For an elite athlete, the CNS controls every aspect of performance potential, including function of skills, biomechanical exact movements, the firing sequences of muscles during activity, reflexes and reaction and countless interrelated physiological functions, including both the central system (heart and lungs) and the peripheral system (muscles). The most significant factor in the brain and CNS functioning at an optimal level is that it is rested. This has been documented throughout decades of studies on reflexes, reaction and many other variables which measure CNS readiness. Recent studies centering on sleep and rest as a factor in optimal physical performance have proved conclusively that sleep is clearly a predictor of performance in any skill based sport.

HERE'S TO THE AFTER HOURS ATHLETE

Life of an
Athlete

Go waste your effort,
throw away your work!

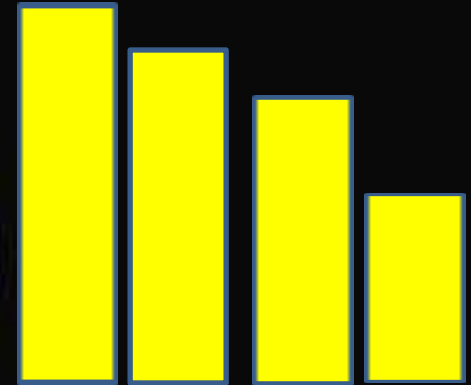


NEURONAL REPAIR

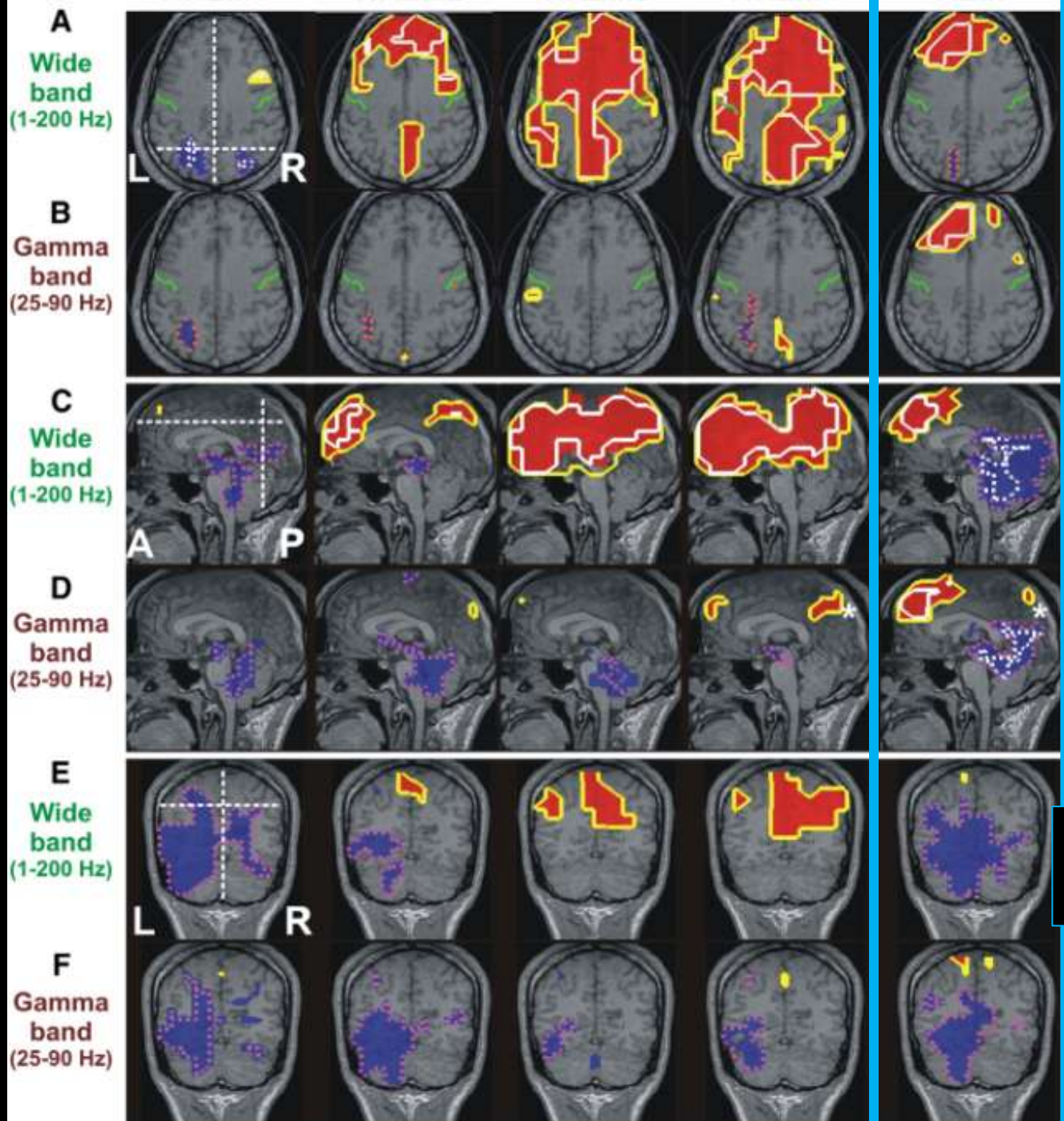
Improper amounts of sleep may cause those same neuronal pathways to become so depleted of energy or flooded with byproducts of cellular activity that they malfunction.



11/2 - 21/2 HOURS
OF REM
IN 24 HOURS



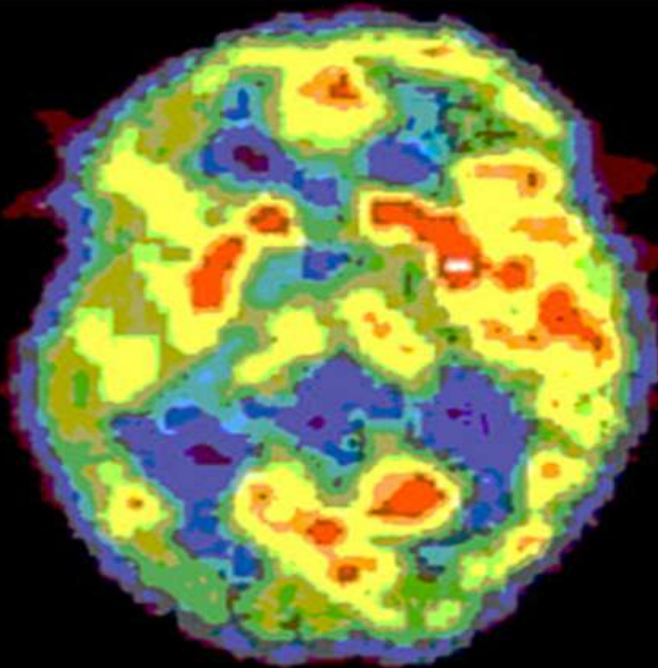
NREM1 NREM2 NREM3 NREM4 REM



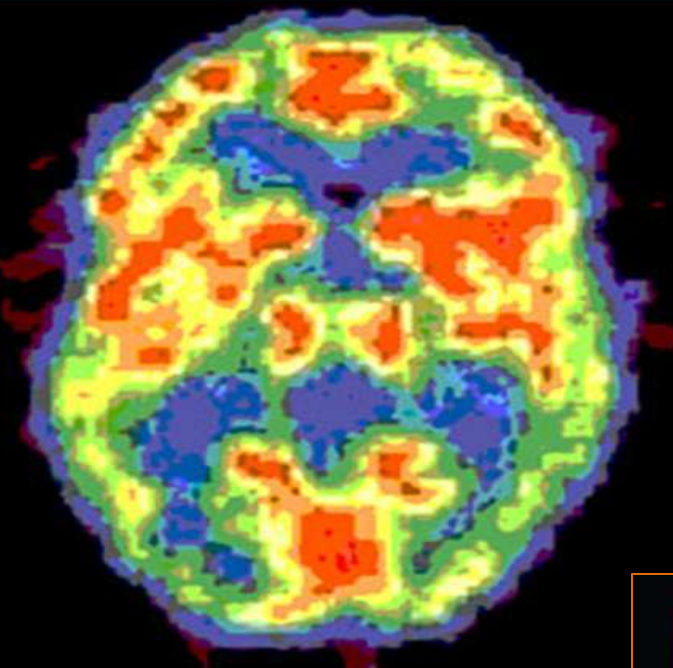
R
E
M

RECHARGE

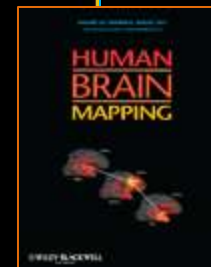




NON REM



REM



You need 1 ½ - 2 1/2 hours of REM
You need 8 hours of total sleep to get it





4-6 HOURS

40-54 MINS

TOTAL SLEEP

ACCUMULATED REM

8 HOURS

1 ½ - 2 HOURS

Rested

Tired

Blood flow in brain



8 hours sleep



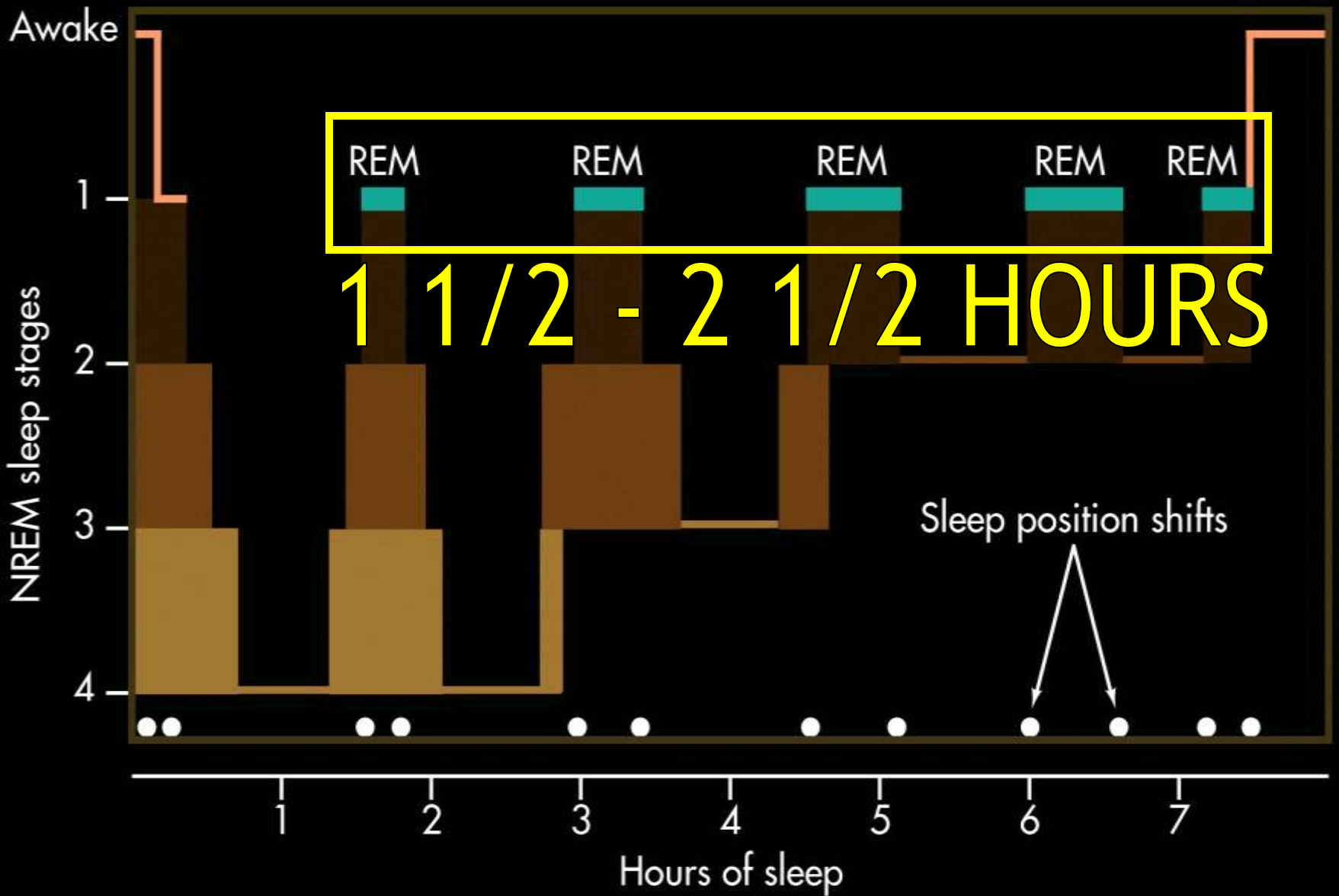
No sleep

WORKS

FAILS

IF THE BRAIN DOESN'T WORK
THE BODY DOESN'T WORK

REPRINTED WITH PERMISSION FROM THE JOURNAL OF NEUROPSYCHIATRY AND CLINICAL NEUROSCIENCE, 6(2006), AMERICAN PSYCHIATRIC ASSOCIATION.

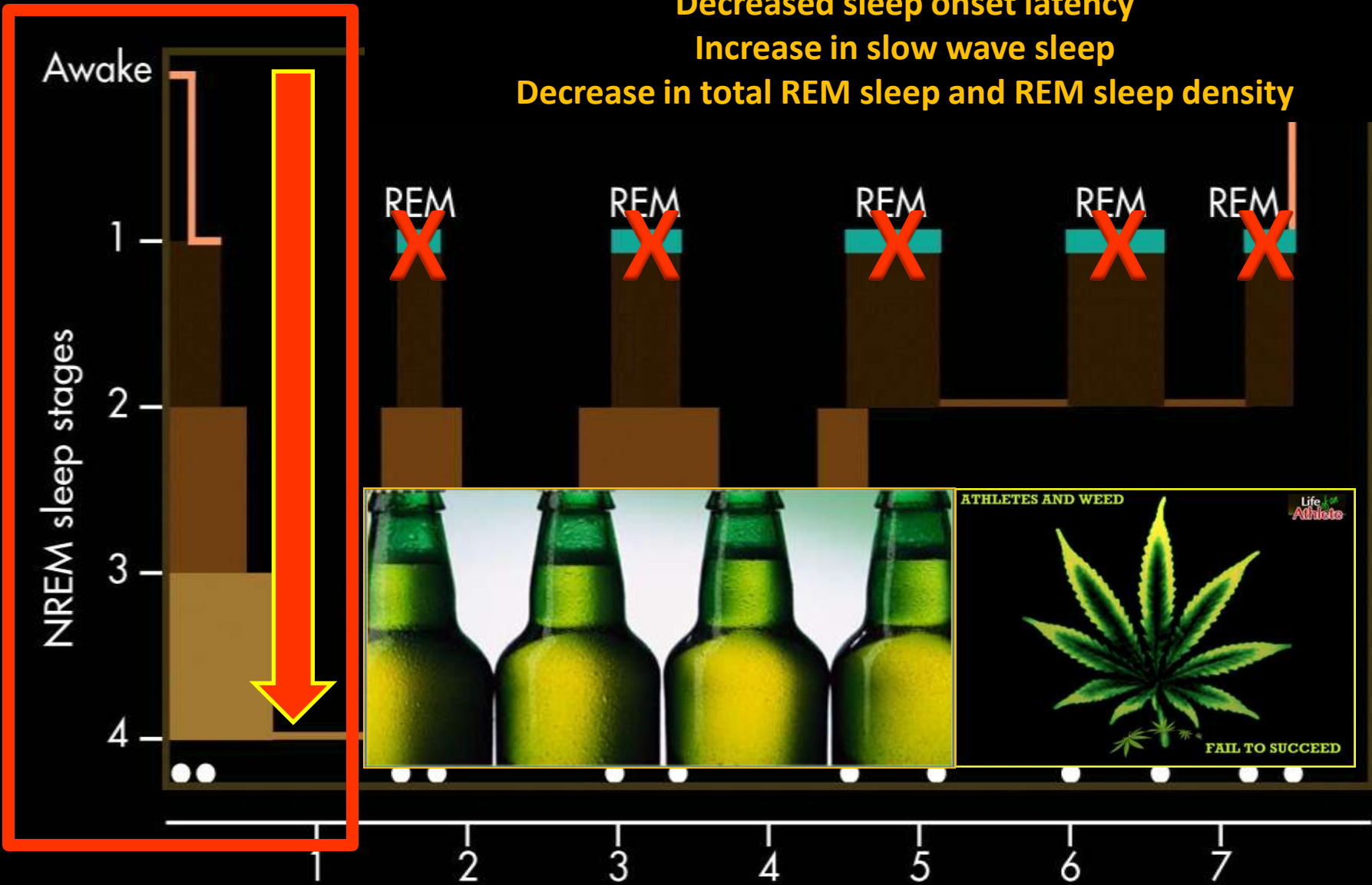


8 HOURS OF SLEEP

Decreased sleep onset latency

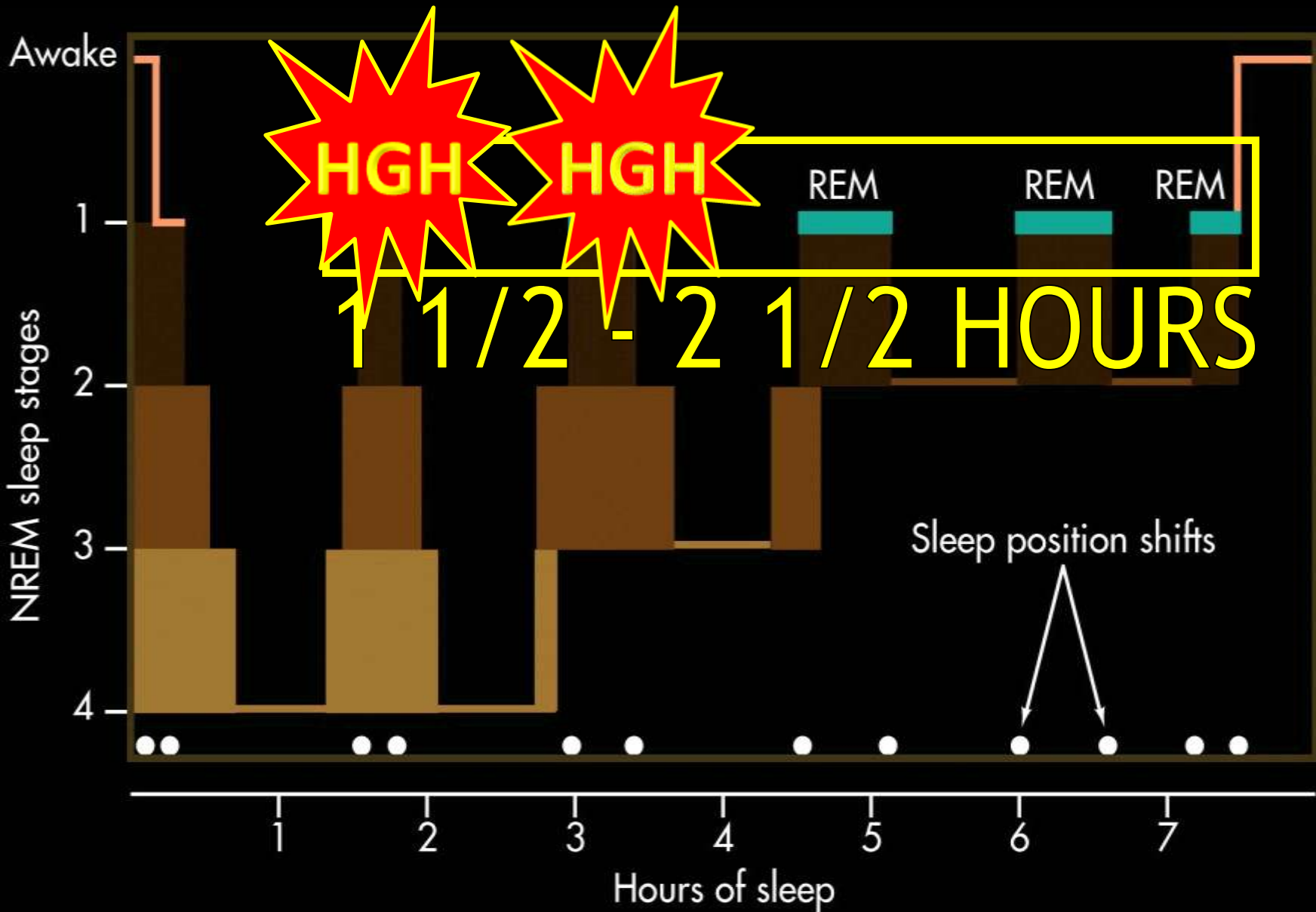
Increase in slow wave sleep

Decrease in total REM sleep and REM sleep density

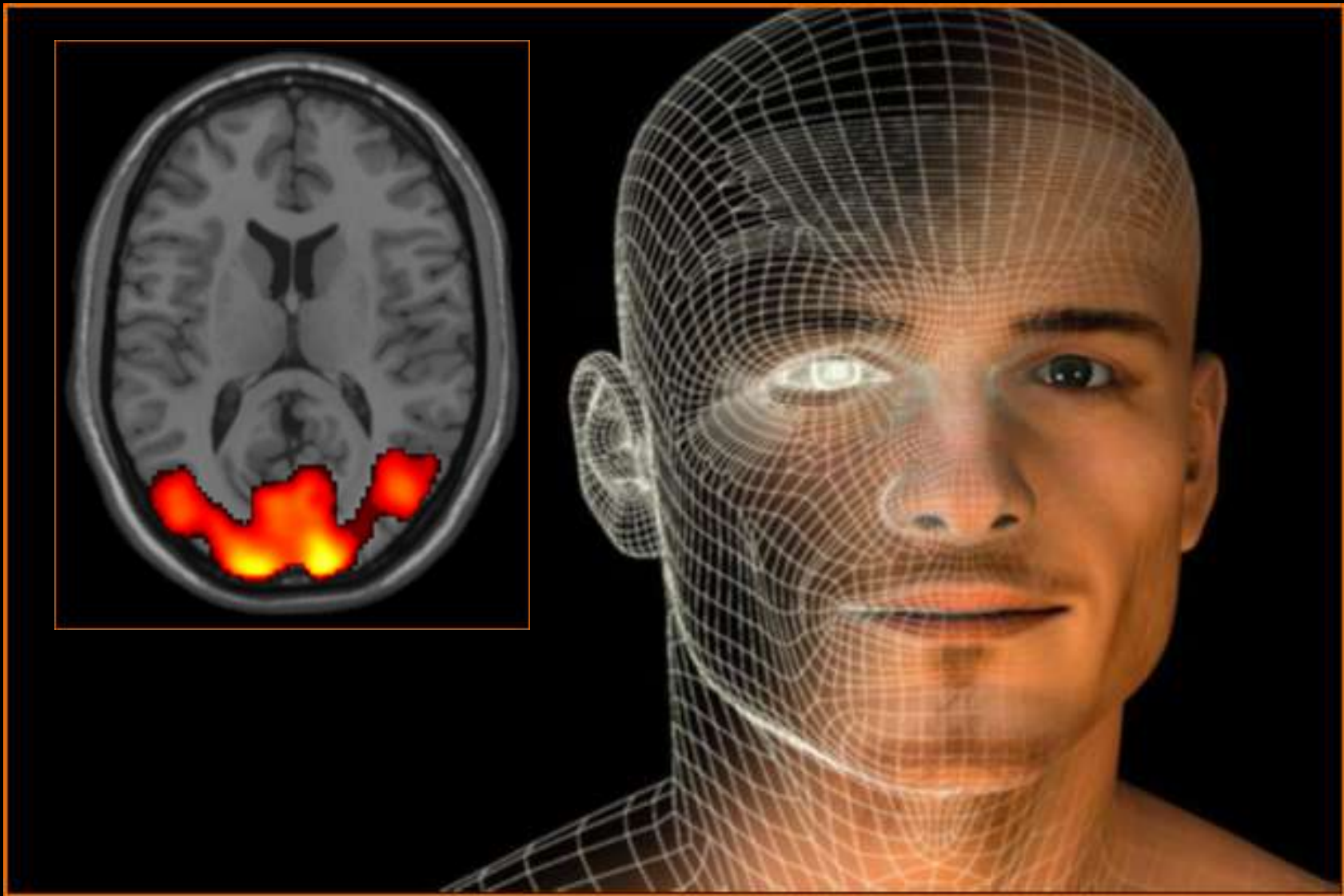


Transition to deep sleep

Lost REM



8 HOURS OF SLEEP



Visual Cortex Energy Drain 

READ



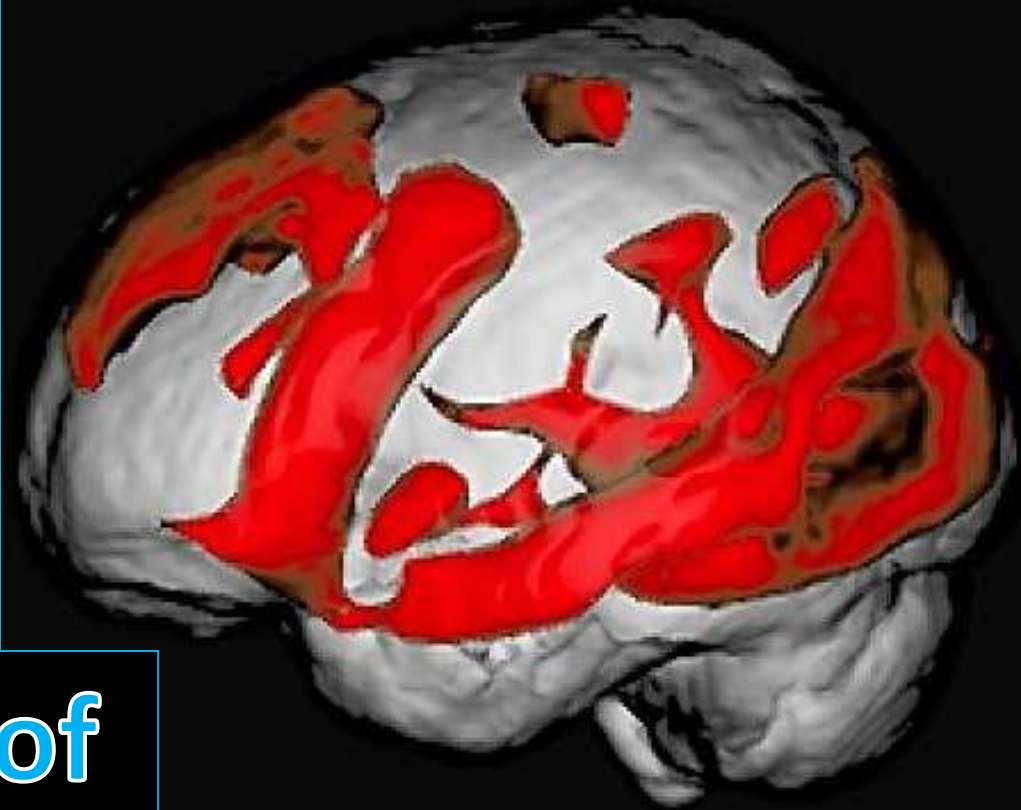
Dr. Gary Small / UCLA / Courtesy to The Chronicle

INTERNET

Rest means Rest...

The CNS can rest
and reboot
critical energy
when the brain
function is
minimal...

Nearly 2/3 of
brains activity



Dr. Gary Small / UCLA / Courtesy to The Chronicle

Biggest Drain



ABILITY TO TRACK AND
FOLLOW MOVING
OBJECTS

ABILITY TO DETERMINE
DEPTH BETWEEN
OBJECTS

THE ABILITY TO
DETERMINE THE SPEED
OR VELOCITY AT WHICH
AN OBJECT IS
TRAVELING

The visual cortex drains much of the CNS energy during the waking hours.





**TECHNOLOGY
BASED LIFESTYLE**

**Is not conducive to optimal training,
recovery, adaptation or performance.**



ATHLETE TIME
MANAGEMENT
VERSUS
TECHNOLOGY

Life *of an*
Athlete

STRESS

TIME LOSS

CNS FATIGUE

RECOVERY DELAYS

METABOLISM CHANGES

LOSS OF FOCUS

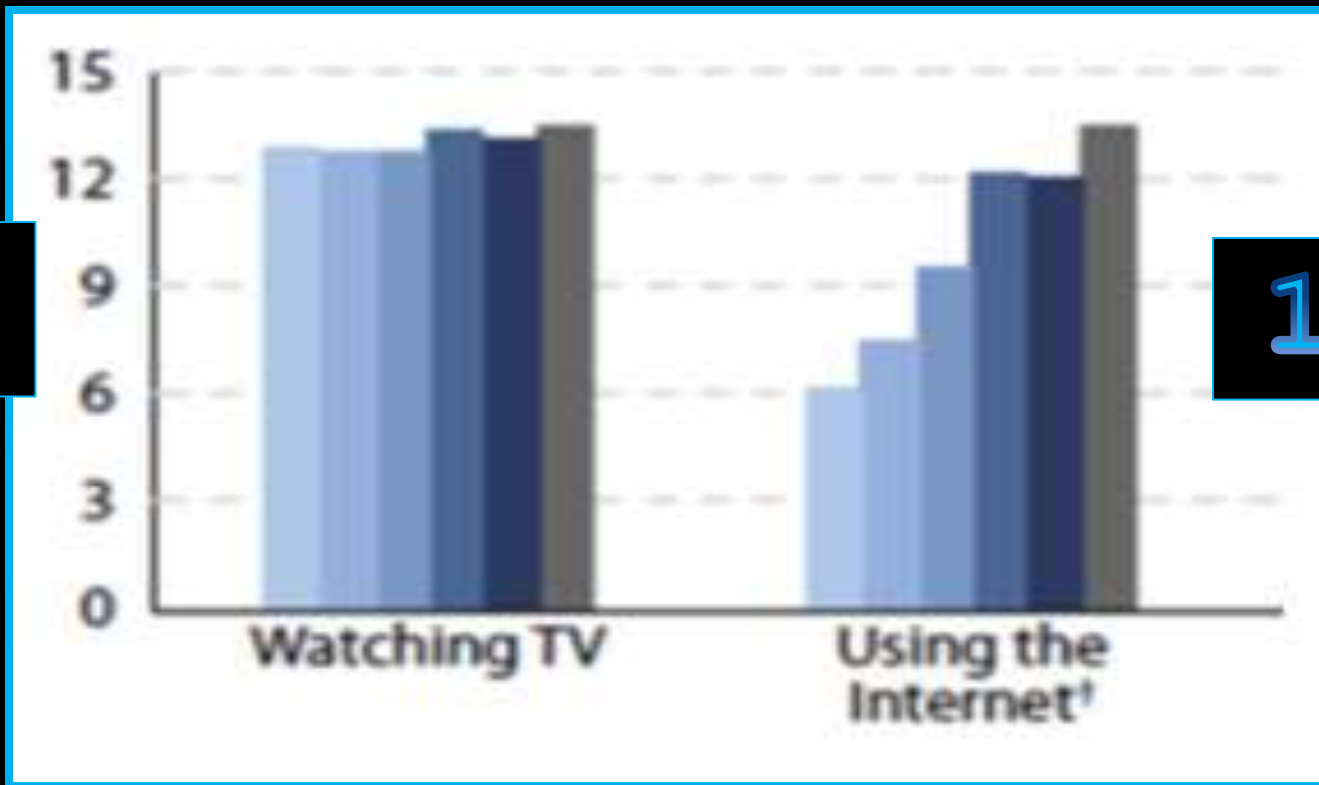
Technology has increased significantly the sedentary hours per week for all populations including athletes.



13 HRS

13 HRS

5%



121%

INCREASE IN TV AND INTERNET TIME IN LAST FIVE YEARS

26 HOURS PER WEEK





+10-15-20 Hours



facebook

wasting athletes time since 2004



FOCUSED

Arousal

Processing

Reaction

Balance

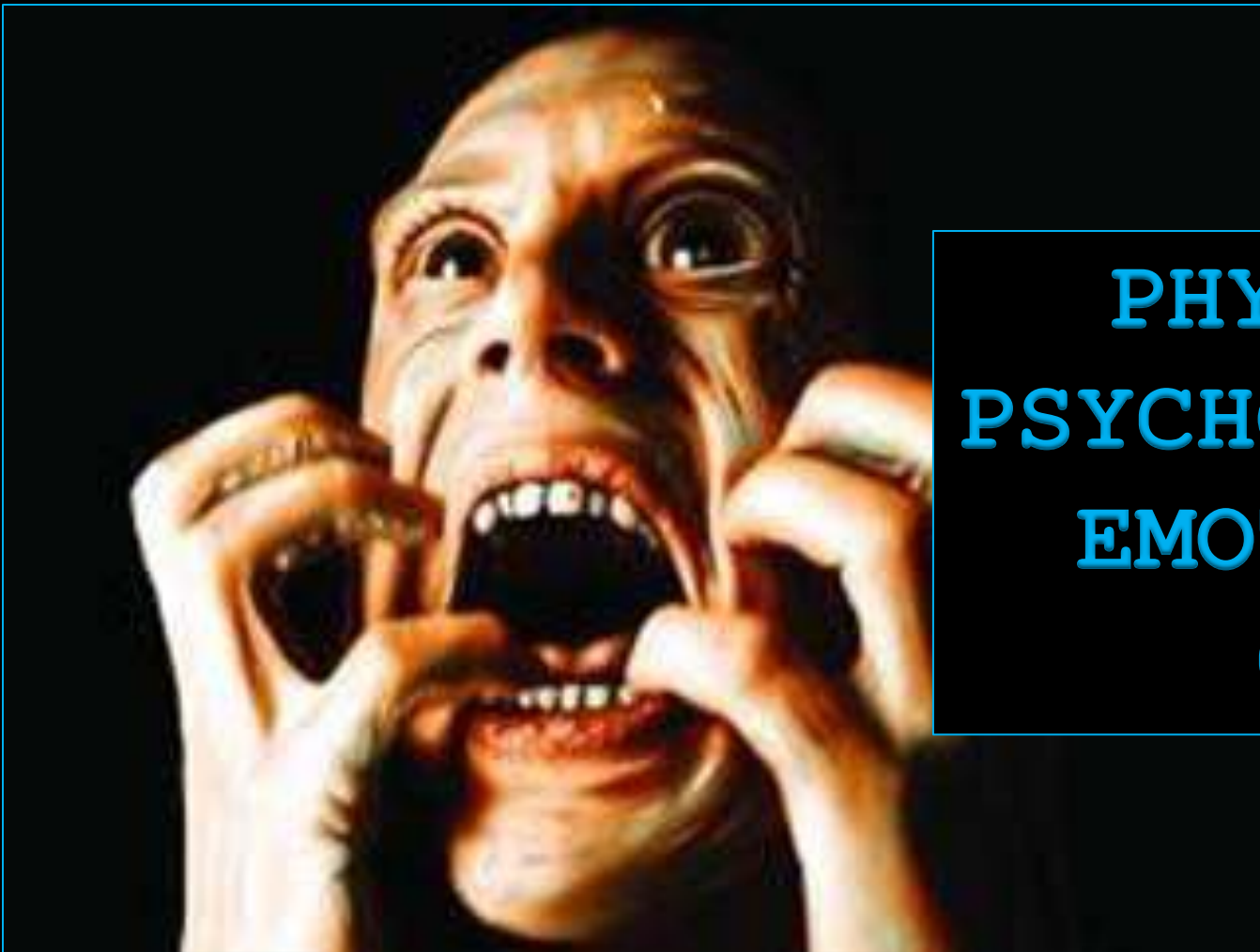
Muscle Memory

There is no way
to make up for
the deficits of
lost sleep with
stimulants



ENERGY DRINKS



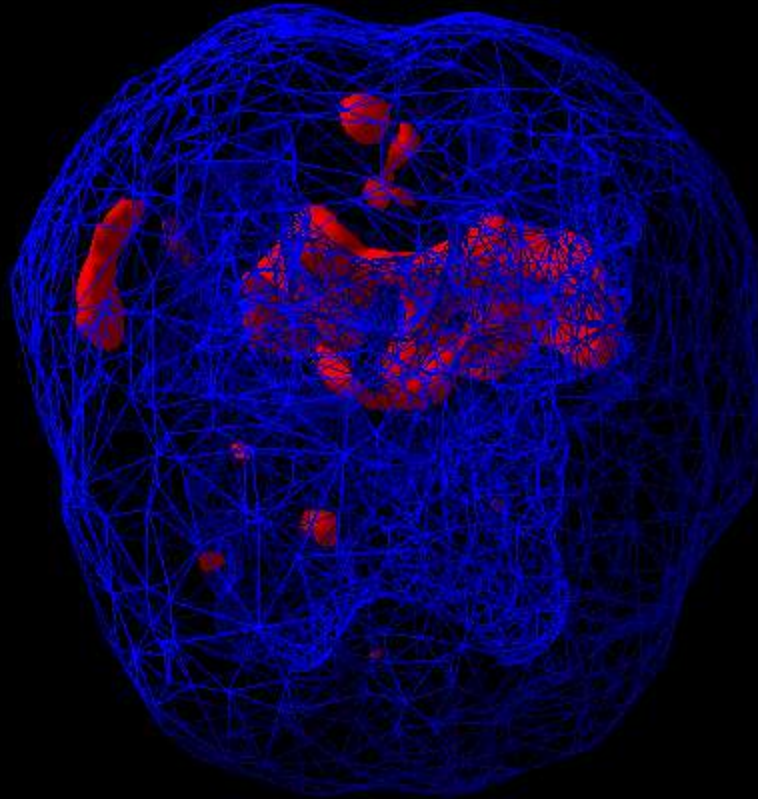


PHYSICAL
PSYCHO-SOCIAL
EMOTIONAL
CNS

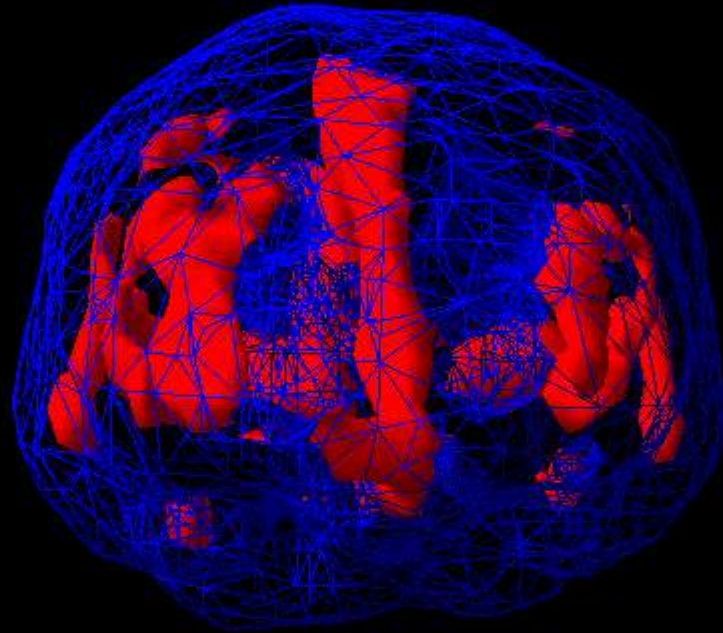
STRESS



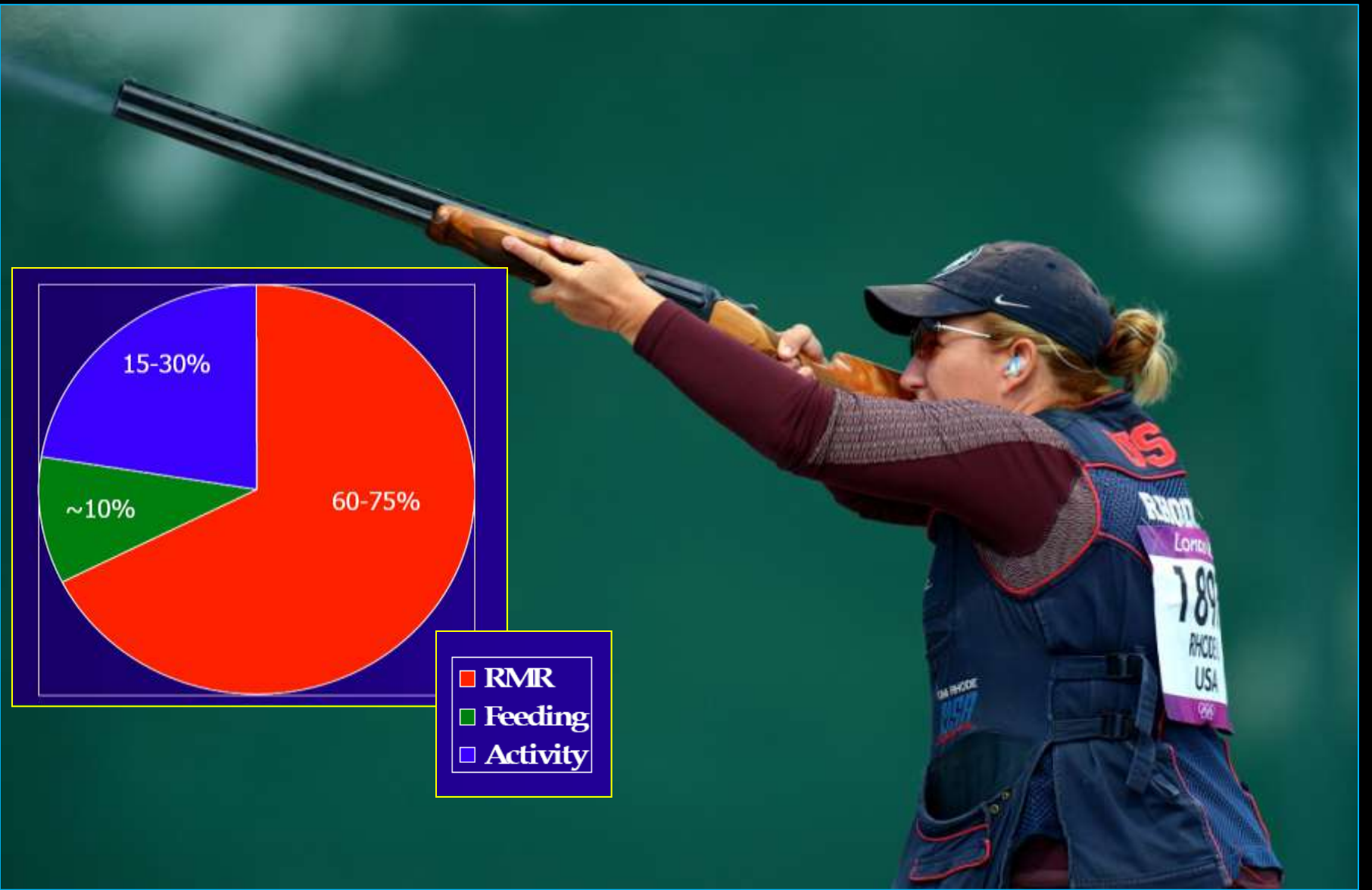
CALM



STRESS



WORRIED



% **TOTAL ENERGY EXPENDITURE**



If we can limit the expenditure of energy during the waking hours we can build energy reserves for high level physical /mental activity. Much of this can be utilized in CNS readiness!



High_{MR} = lost fuels
Structural fatigue
Lost CNS readiness
Lost performance

Wasting Energy





Monitoring STRESS and RECOVERY

JOB STRESS
RELATIONSHIP STRESS
FAMILY STRESS
PHYSICAL STRESS
EMOTIONAL STRESS
METABOLIC STRESS

TV VIDEOS
TEXTING
FACEBOOK
SOCIAL LIFE
AFFILIATIONS
ACADEMICS



READINESS TO TRAIN/COMPETE



Poor recovery

Increased risk of overtraining

Moderate recovery

Easy training recommended

Good recovery

No risk of overtraining



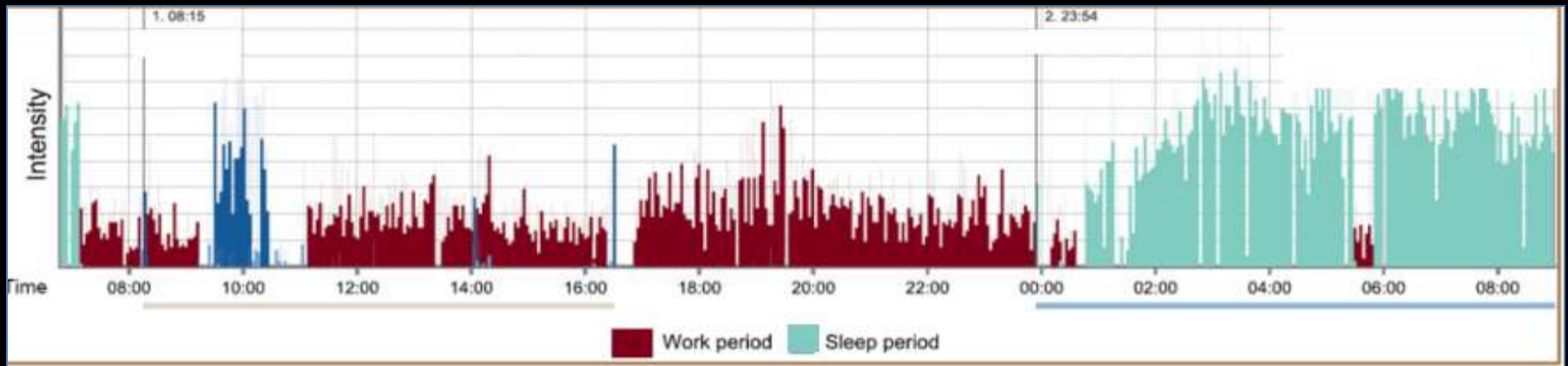


 **omegawave™**

2 : 1

**AWAKE
STRESS**

**ASLEEP
RECOVER**



16 HOURS

8 HOURS

DAILY STRESS



LIFESTYLE AND RECOVERY



The single most overlooked aspect of athlete failure is issues related to recovery...





24 HOURS

BODY RECOVERY

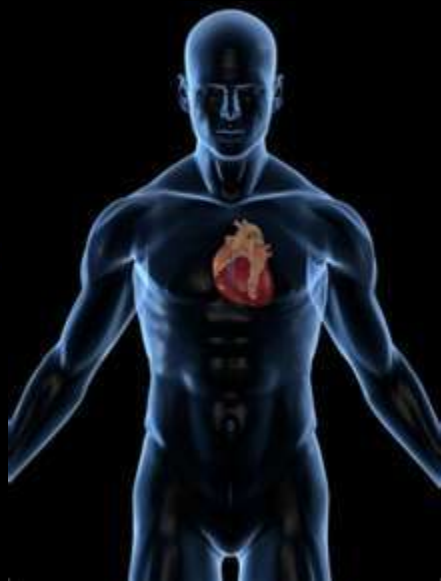


BODY MUST BE RESTED WHEN YOU TRAIN

The CNS takes much longer to recover than the heart lungs and muscle systems...

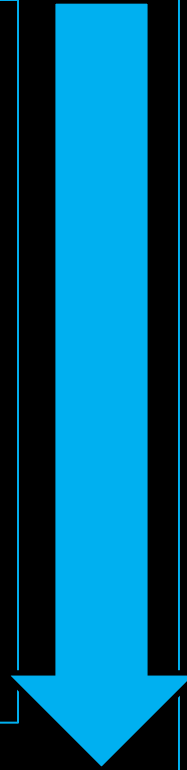
48 HOURS

24 HOURS



RECOVERY

HOUR 1
HOUR 8
HOUR 24



70%
20%
10%

DYNAMICS OF RECOVERY AND TIME



FATIGUE

Fatigue, which is at the root of the whole recovery paradigm, can be split into four categories:

Neuro-Muscular Fatigue

Metabolic Fatigue

Structural Fatigue

Endocrine Fatigue



The logo for '60 MINUTES' is centered in a dark square. The number '60' is large and white, with a subtle red glow behind it. Below it, the word 'MINUTES' is written in a smaller, white, sans-serif font.

60
MINUTES

The first hour

During the first hour after a workout the majority of recovery takes place and training effect is maximized.



The single most critical factor in training effect taking place or not...

POST TRAINING NUTRITIONAL RECOVERY



CARBS



PROTEIN



Carbohydrate functions:
Replenish muscle glycogen
Spike insulin secretion
Reduce cortisol (stress hormone)

Protein functions:
Reduce muscle damage
Build fitness infrastructure
Accelerate Growth Factors

WITHIN MINUTES





The highest rates of nutrient uptake occur during the first 10mins after training .



This is because all the nutrient transport and storage mechanisms become switched on thus increasing the body's absorption rates. The nutrients that are required are glucose (from Carbohydrate) and amino acids (from Proteins).

THE QUICKER THE BETTER





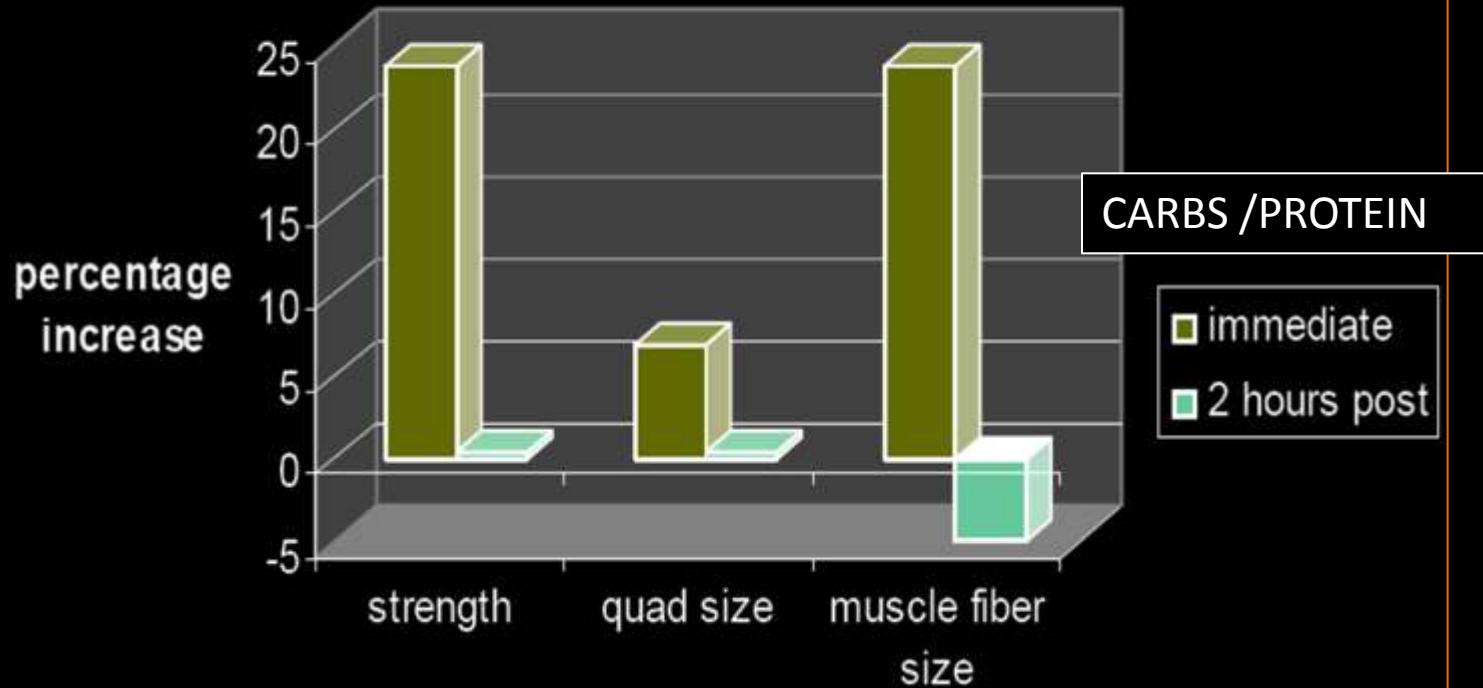
PROTEIN

Protein blunts negative effects
Accelerates positive factors in muscle

Fast Protein Critical

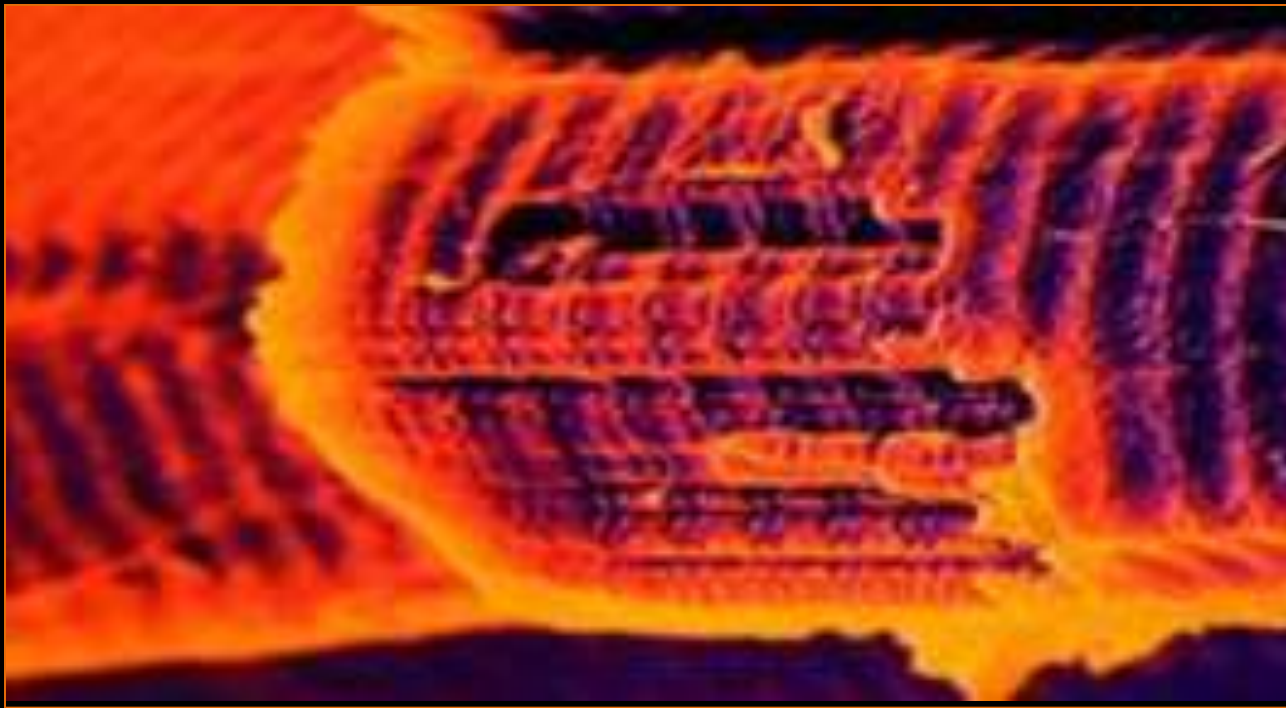


Changes in strength, muscle size, and muscle fiber size



Don't Wait



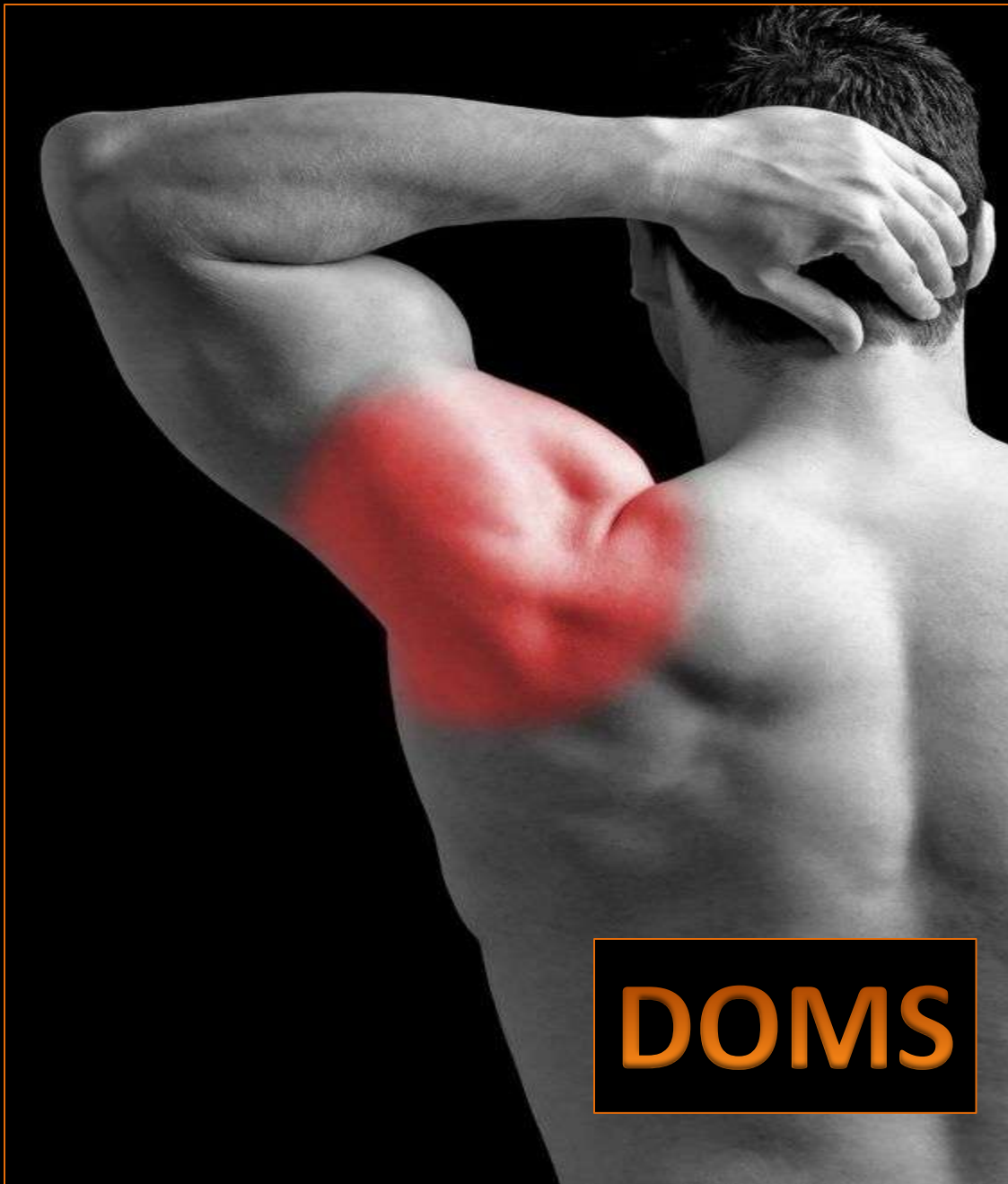


There is muscle damage from any kind of physical activity

The higher the intensity the greater the damage

MUSCLE DAMAGE





**Soreness after
training**

**1-3-5-7 hours
post workout**

**No Pain
No Gain**

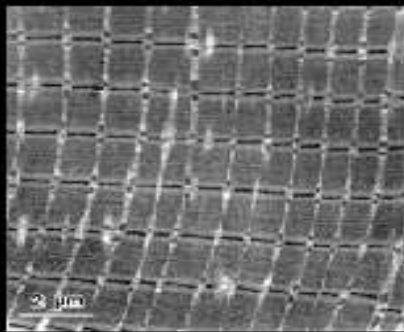
DOMS



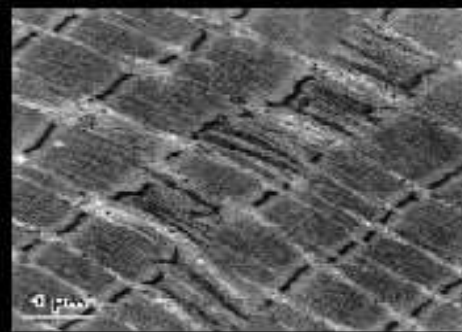
Life of an Athlete

Please Re-Rack Your Weights

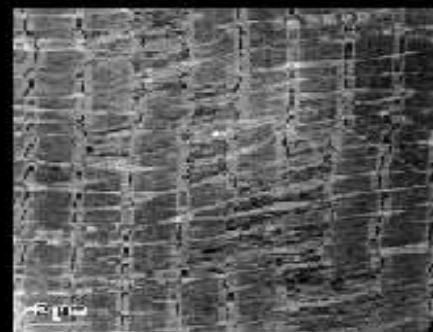
Intramuscular damage occurs from even easy training and muscle is in a state of constant repair. You cannot train hard all the time or you cannot recover. If you cannot recover you cannot adapt. If you cannot adapt you will not increase your capacity for speed power or skills. Training is a science!



rested muscle



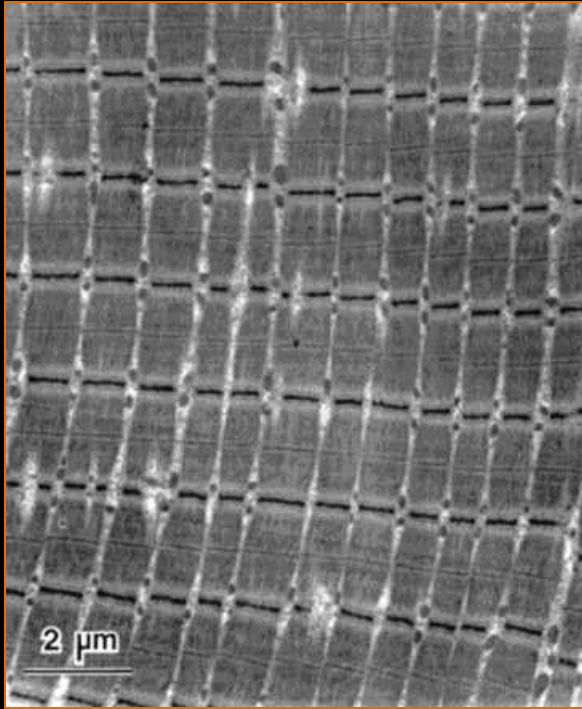
moderate damage



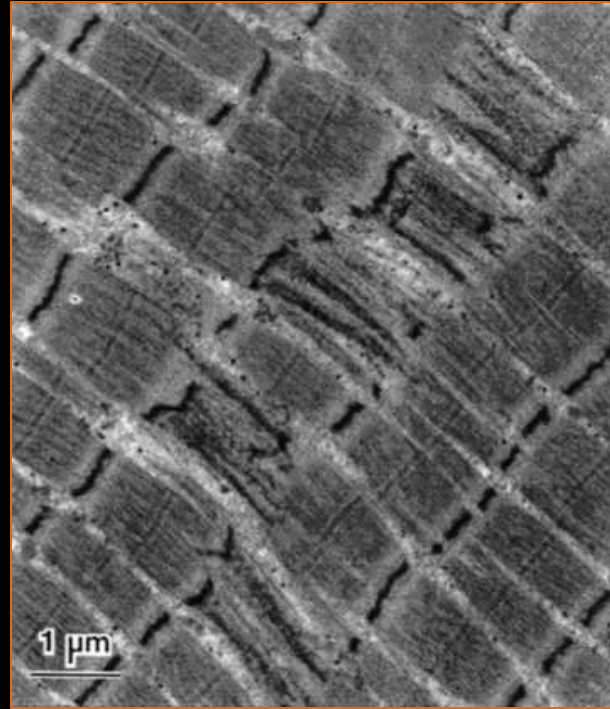
extreme damage

TRAIN SMARTER





NORMAL



MODERATE

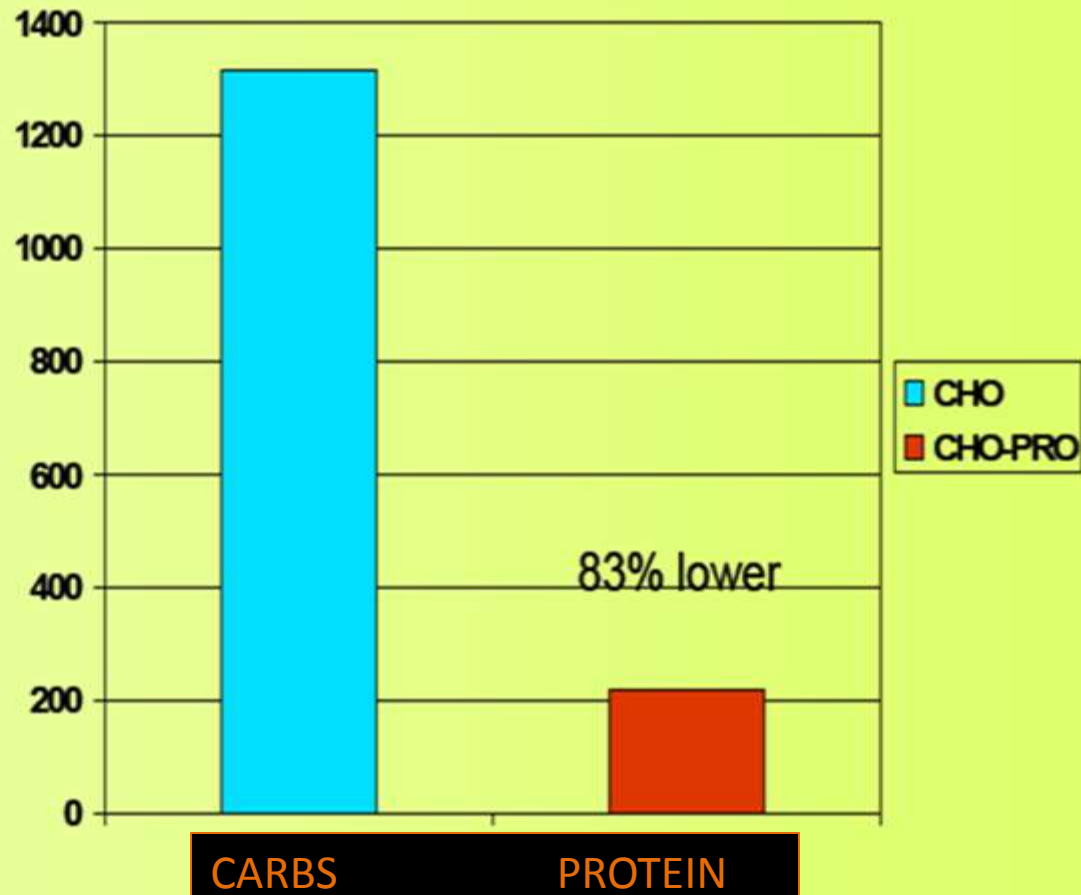


EXTREME

Muscle Damage



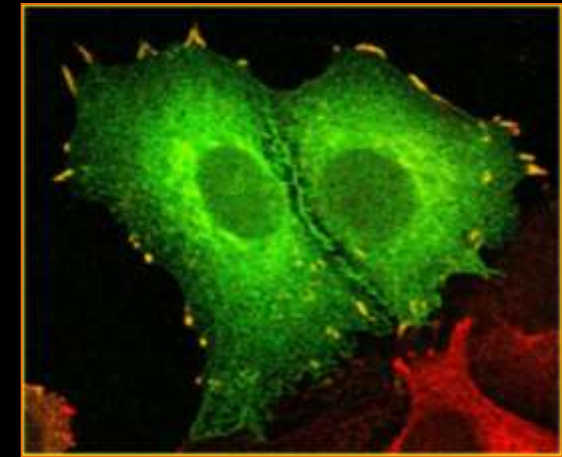
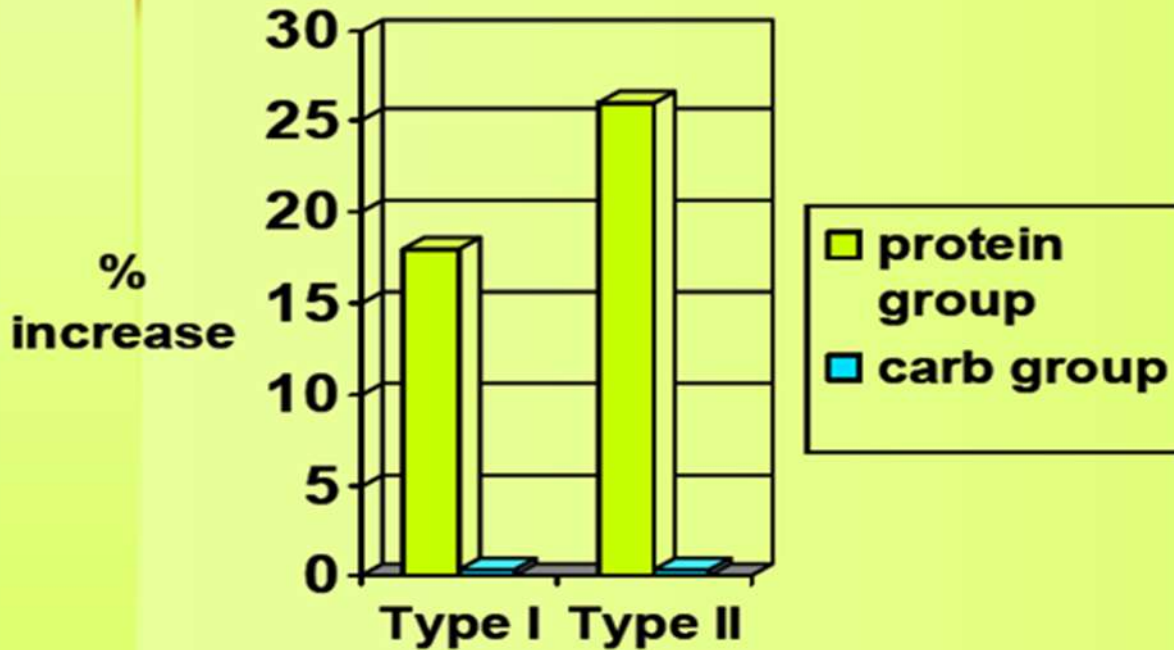
CARBS AND PROTEIN AFFECT ON MUSCLE DAMAGE



How sore do you want to be?



Muscle Fiber Hypertrophy in Protein Group



**NEW
MASS**

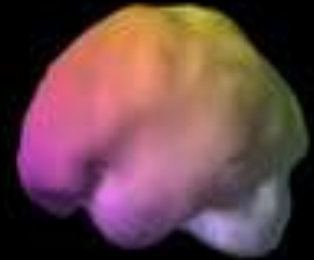
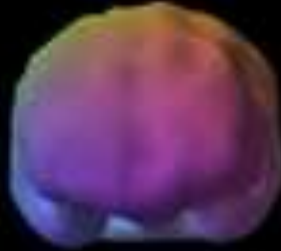
Muscle Protein Synthesis



What's this?

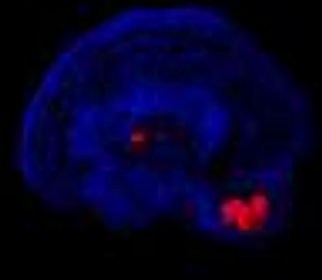
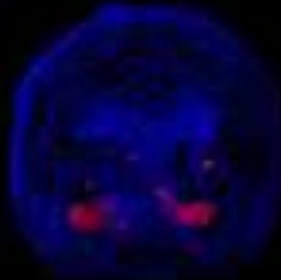
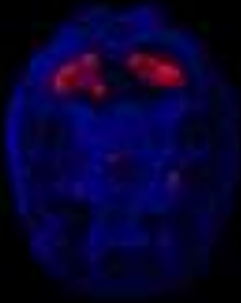


DAMAGE



Amen Clinics

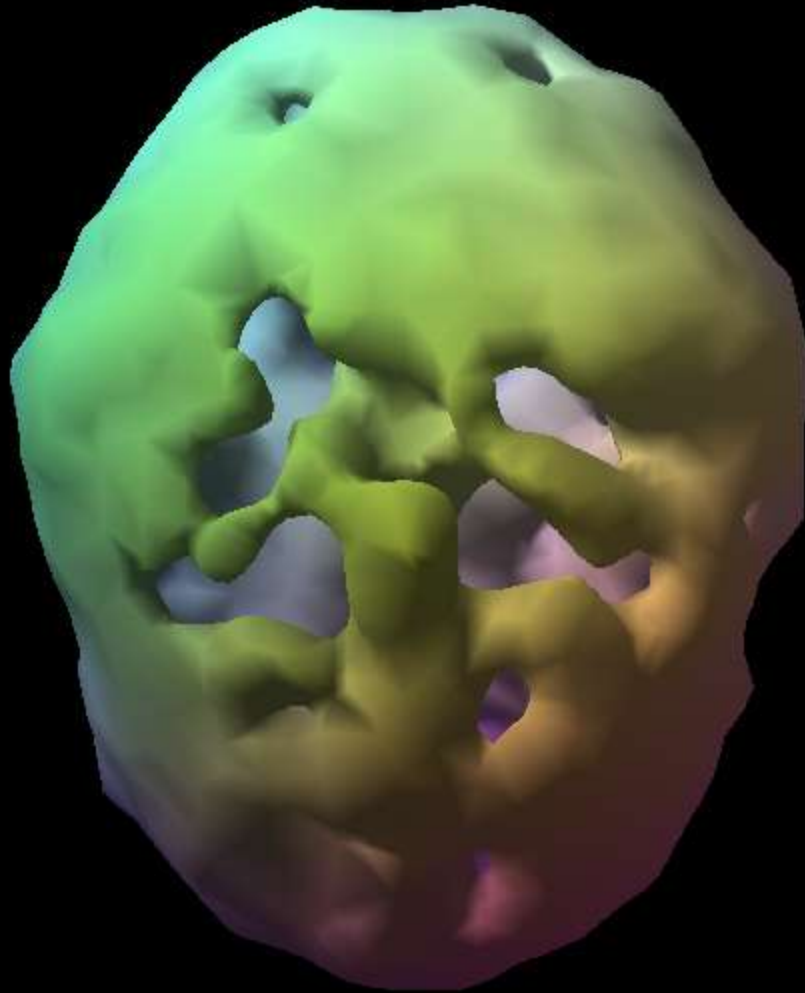
Single Photon Emission Computerized Tomography



ACTIVITY

SPECT





Amen Clinics

We now have
indisputable
evidence of
systemic
damage and
cumulative
damage.

BRAIN SCIENCE ADVANCES

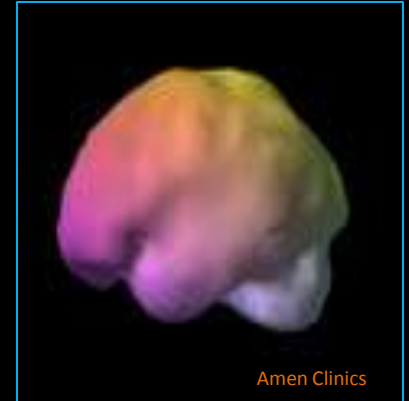
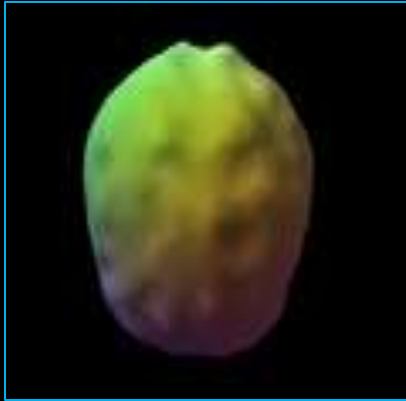


TOP

FRONTAL

BOTTOM

SIDE

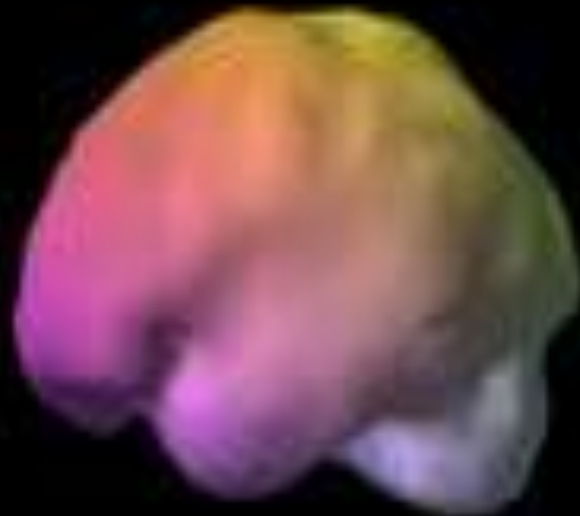


**NORMAL
HEALTHY**

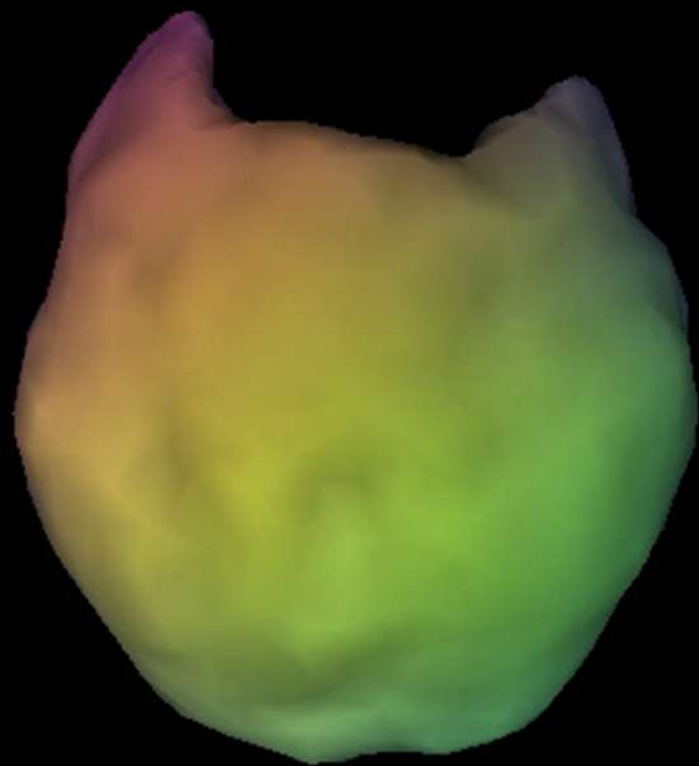
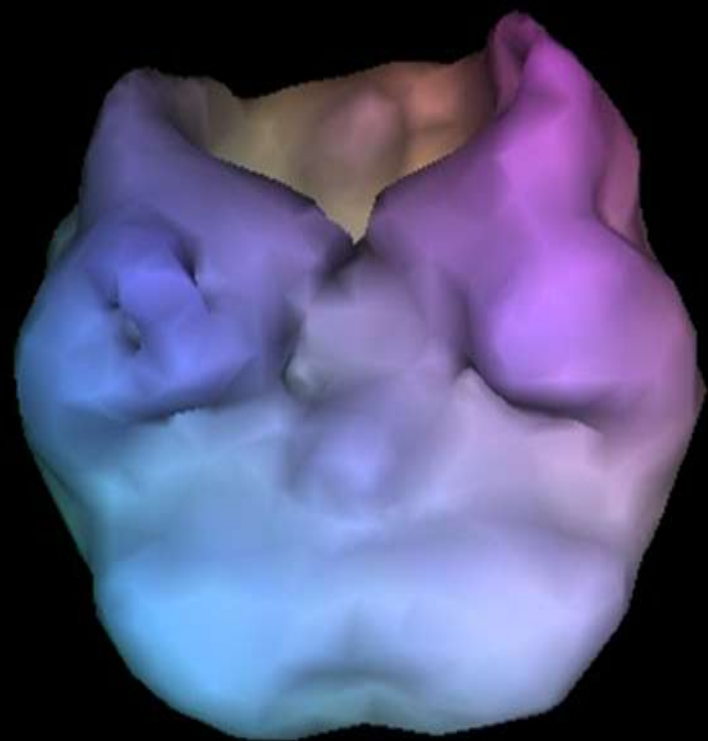




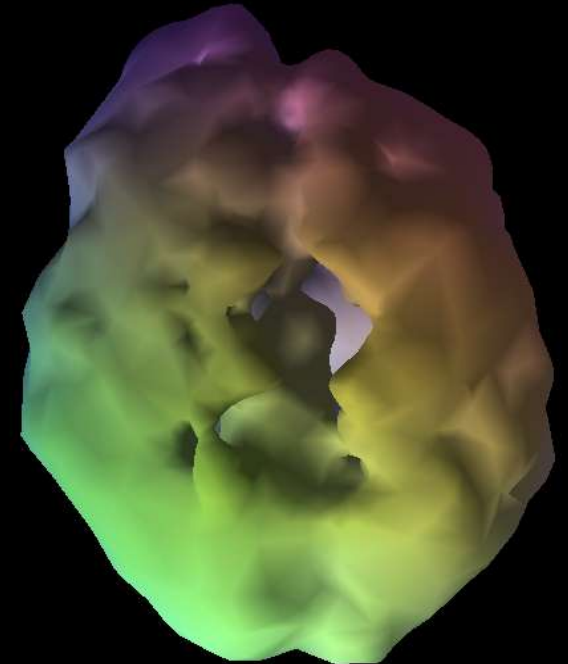
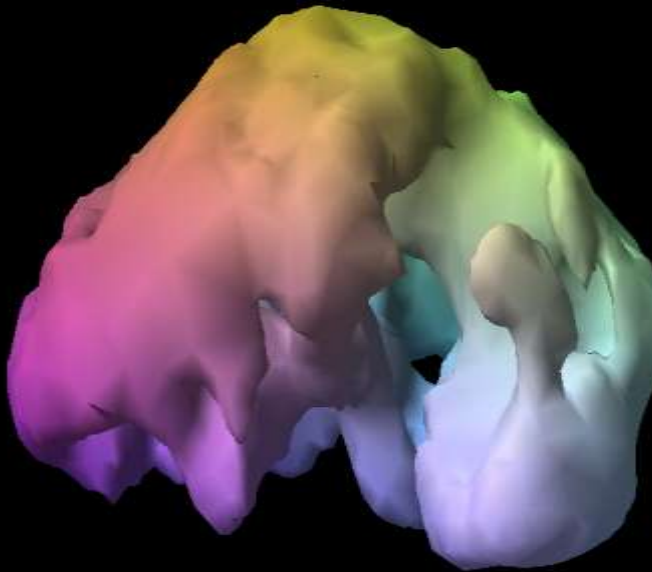
NORMAL HEALTHY



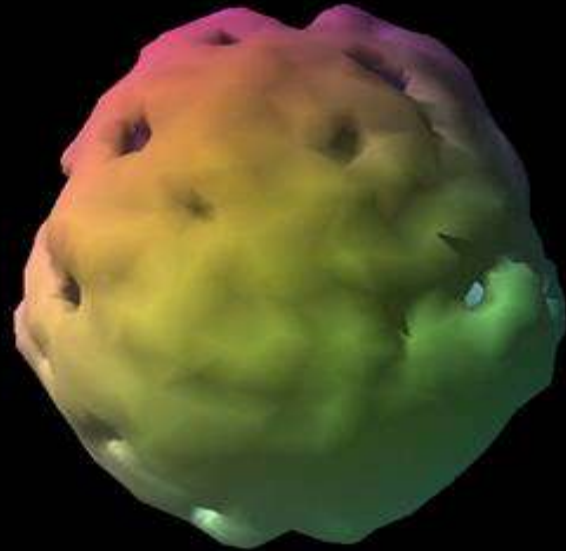
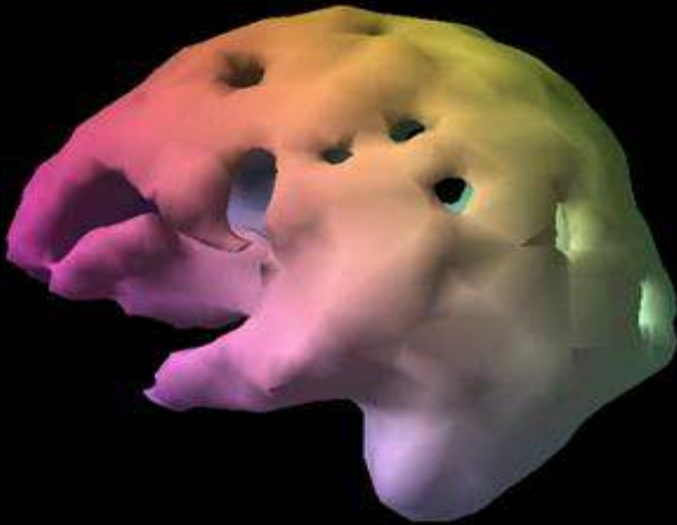
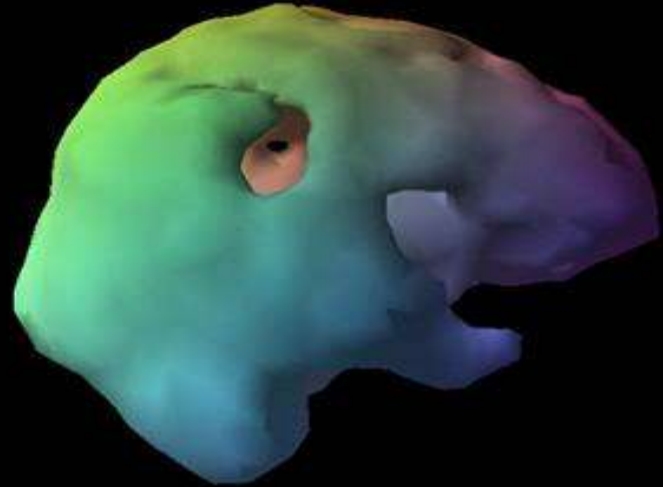
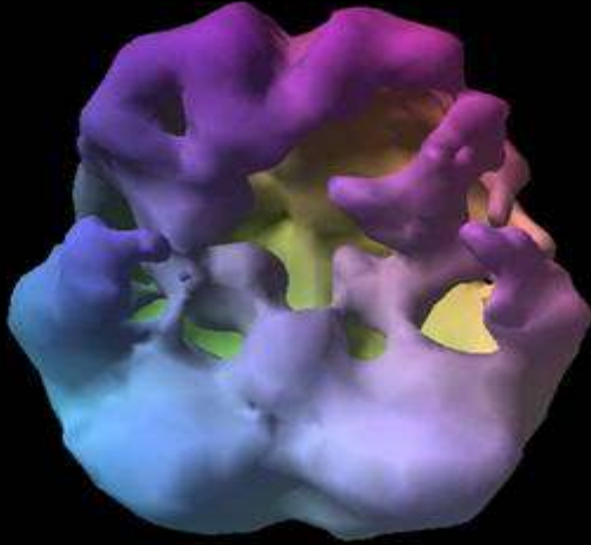
Severe Brain Injury



NFL NHL BRAIN INJURY STUDIES



MULTIPLE HEAD INJURIES



PERFORMANCE DEBILITATING



DRUGS



POSTED BY
DRUNK IN COLLEGE

the Superficial



"Marijuana helps me relax, without affecting my athletics."

Michael Phelps

14 Time Olympic Gold Medalist

Marijuana: Inspiring successful Americans since 1776.

Get the facts about Marijuana. For more information, please contact:



The Hemp and Cannabis Foundation
Legalize. Regulate. Educate.

WORLD PICTURE EXCLUSIVE

PHELPS GOES BONG

Olympic gold medal winner caught with cannabis pipe



14 OLYMPIC GOLD MEDALS
37 WORLD RECORDS.
2 AWESOME LUNGS.



Unlike heavy tobacco smokers, heavy marijuana smokers exhibit no obstruction of the lung's small airway. That indicates that people will not develop emphysema from smoking marijuana. For more information visit clubfbi.com/marijuana

Don't let the government fool you

LEBOHEE MORIHONO
Authorised by the High Range Centre, Sydney, Australia



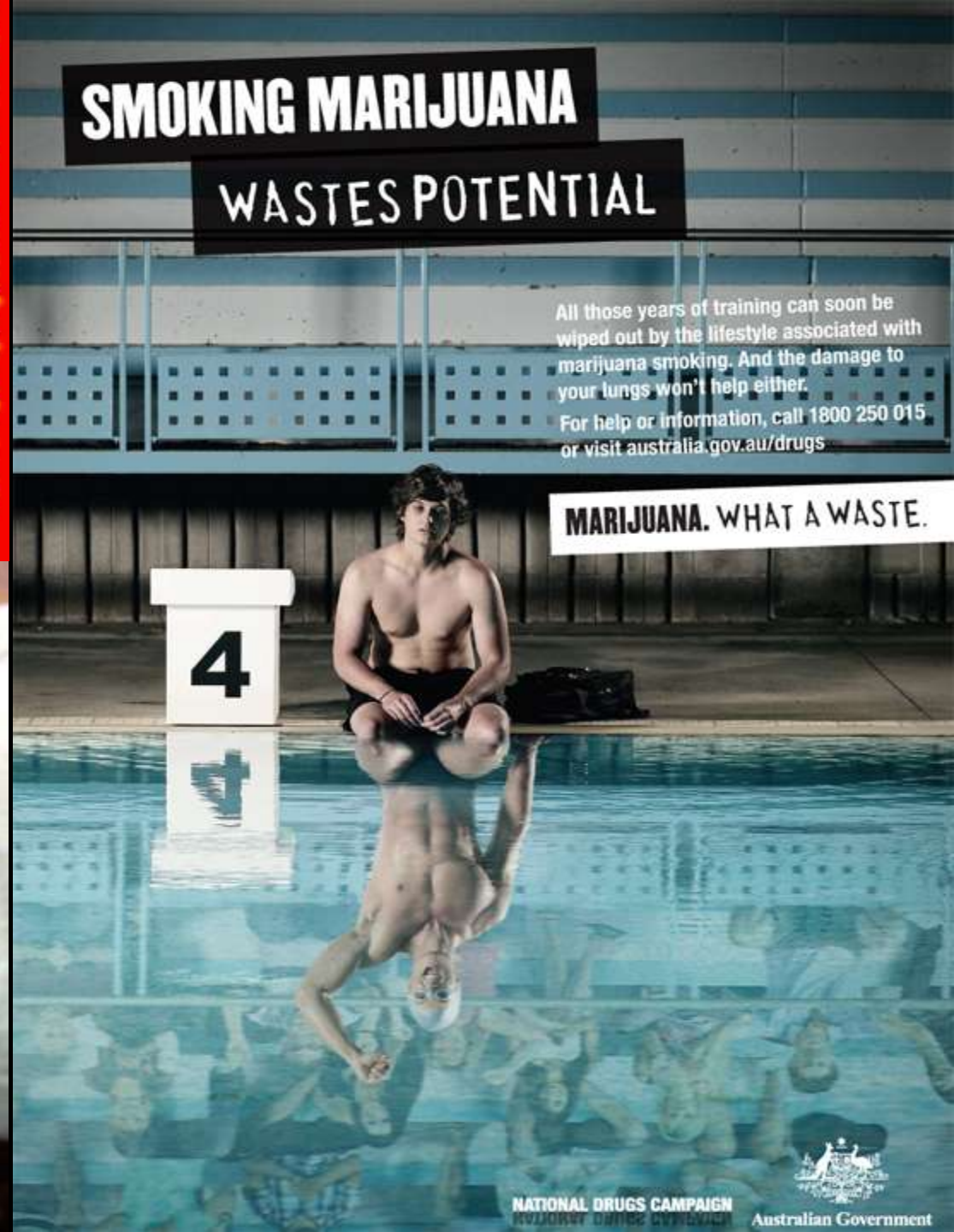
SMOKING MARIJUANA

WASTES POTENTIAL

All those years of training can soon be wiped out by the lifestyle associated with marijuana smoking. And the damage to your lungs won't help either.

For help or information, call 1800 250 015 or visit australia.gov.au/drugs

MARIJUANA. WHAT A WASTE.



4

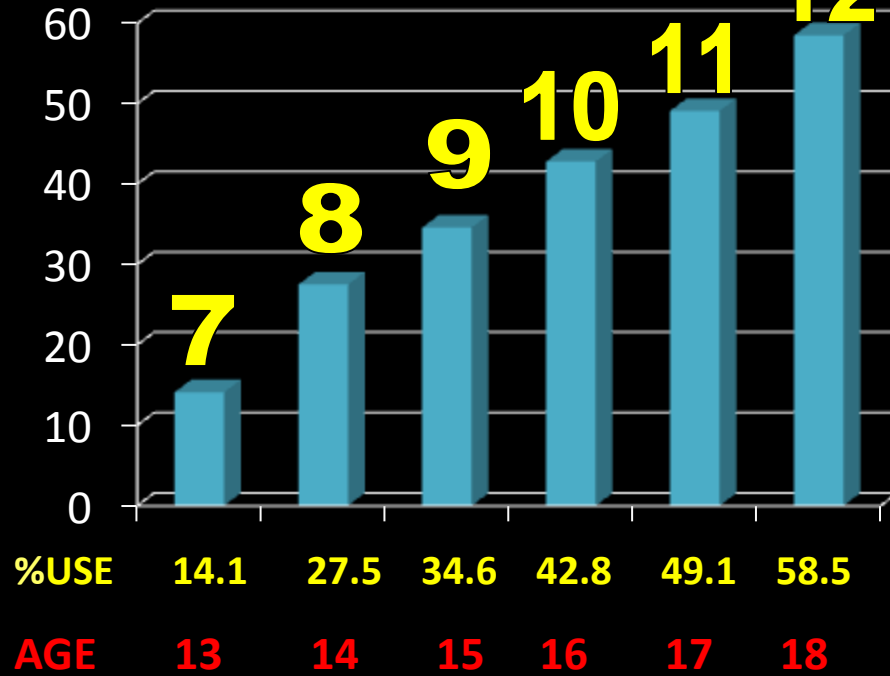
NATIONAL DRUGS CAMPAIGN
NATIONAL OFFICE OF DRUGS



Australian Government

JR. ATHLETES REPORTING ALCOHOL USE DURING SPORT YEAR

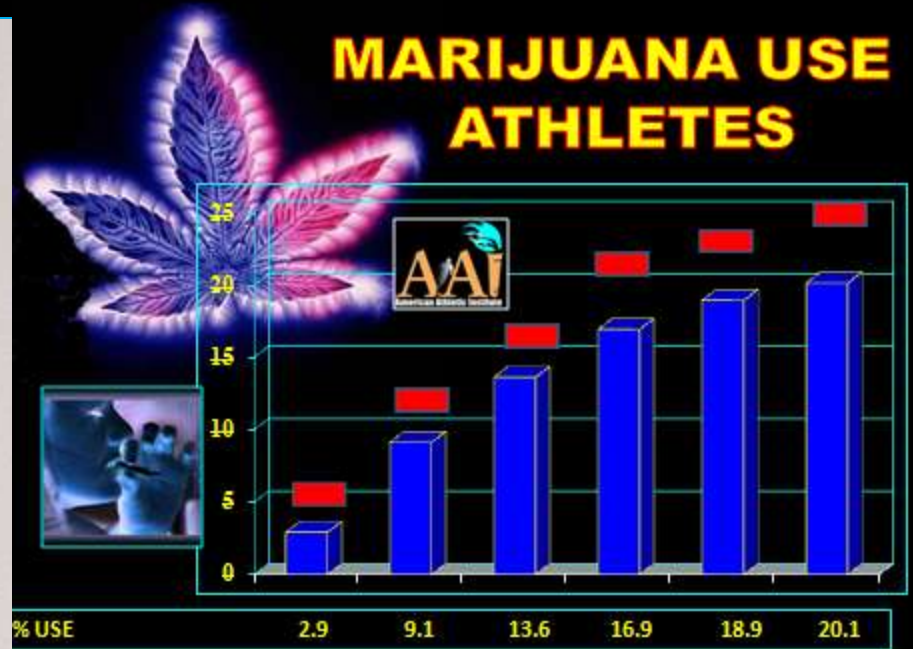
12 GRADE



ALCOHOL USE
ATHLETES



Middle School – High School



Middle School – High School

Lifestyle choices begin early in athlete populations. They are in independent situations from a much earlier age and are influenced much more by pack mentality...

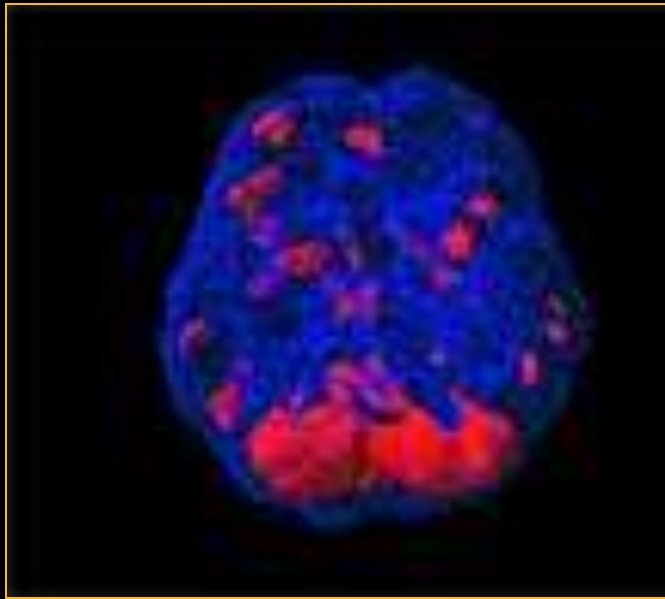
83% ALCOHOL



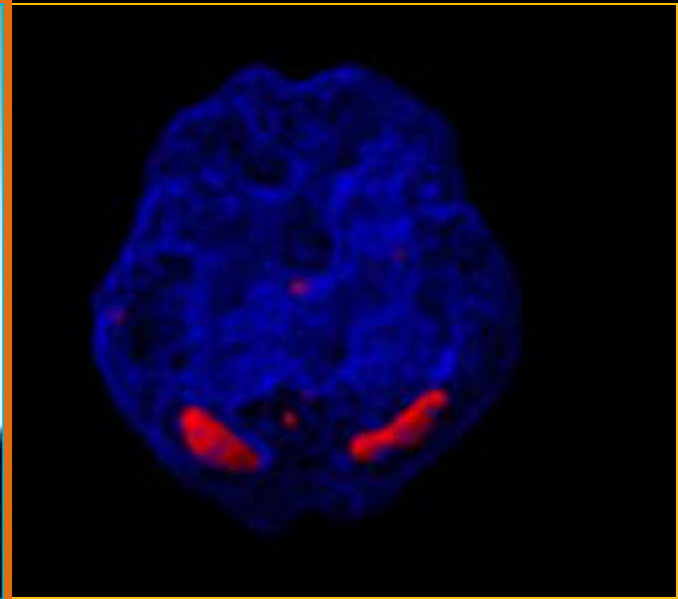
Social Drugs

27% MARIJUANA

Brain Activity Alcohol



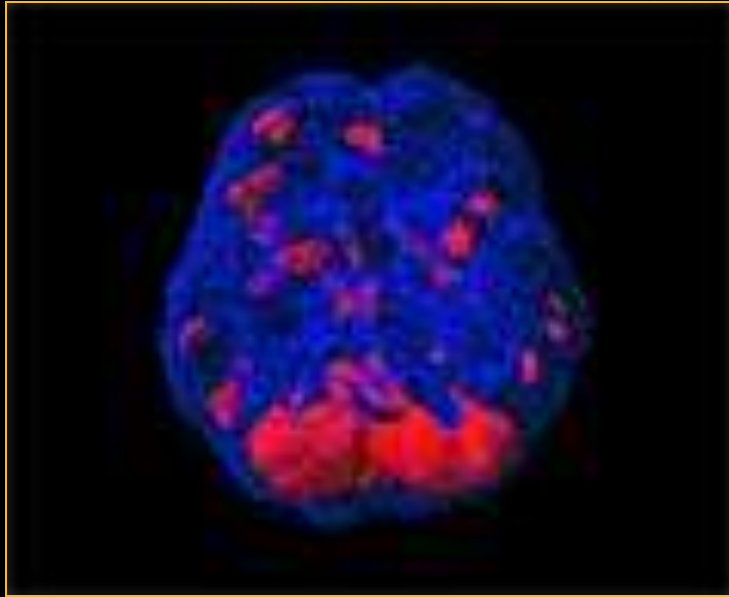
Not under
influence



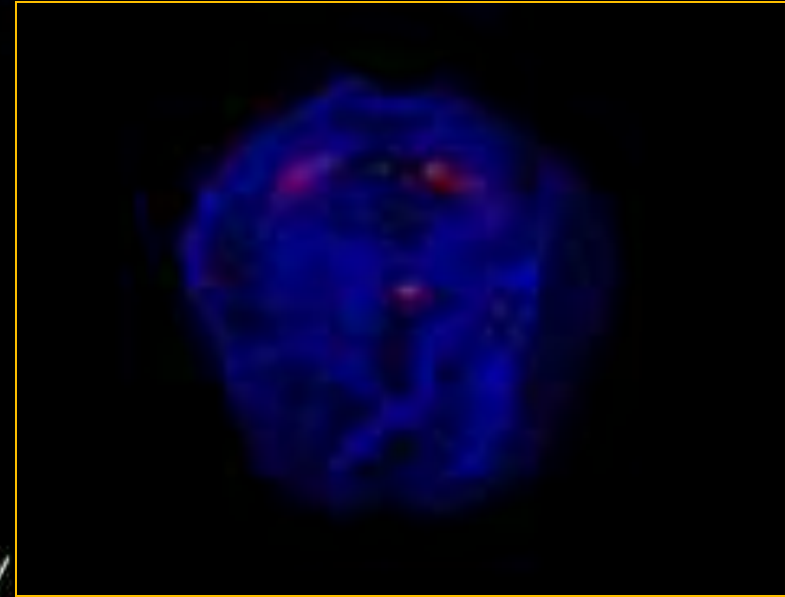
Intoxicated



Brain Activity Marijuana



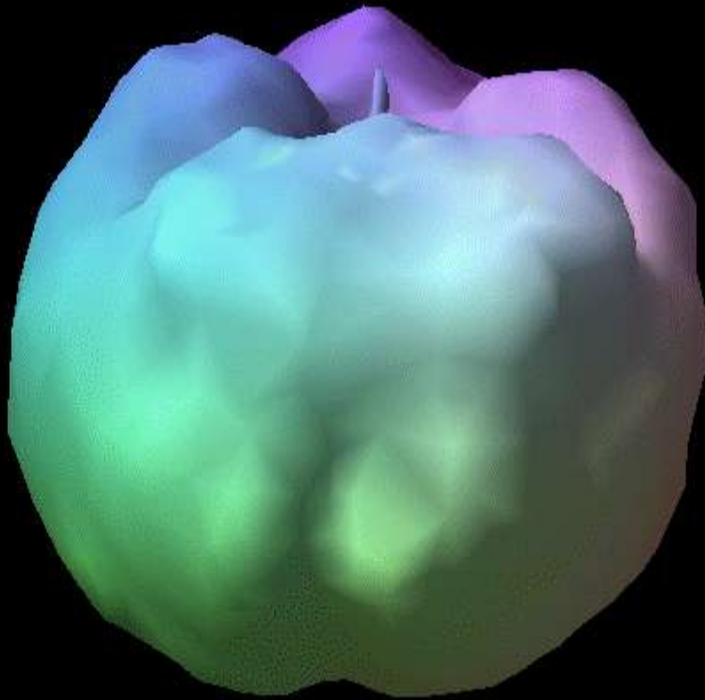
Not under
influence



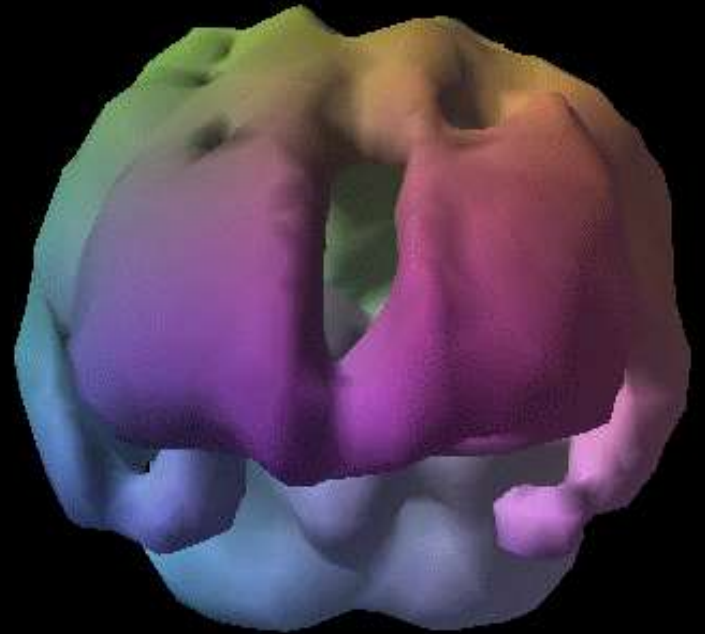
Stoned

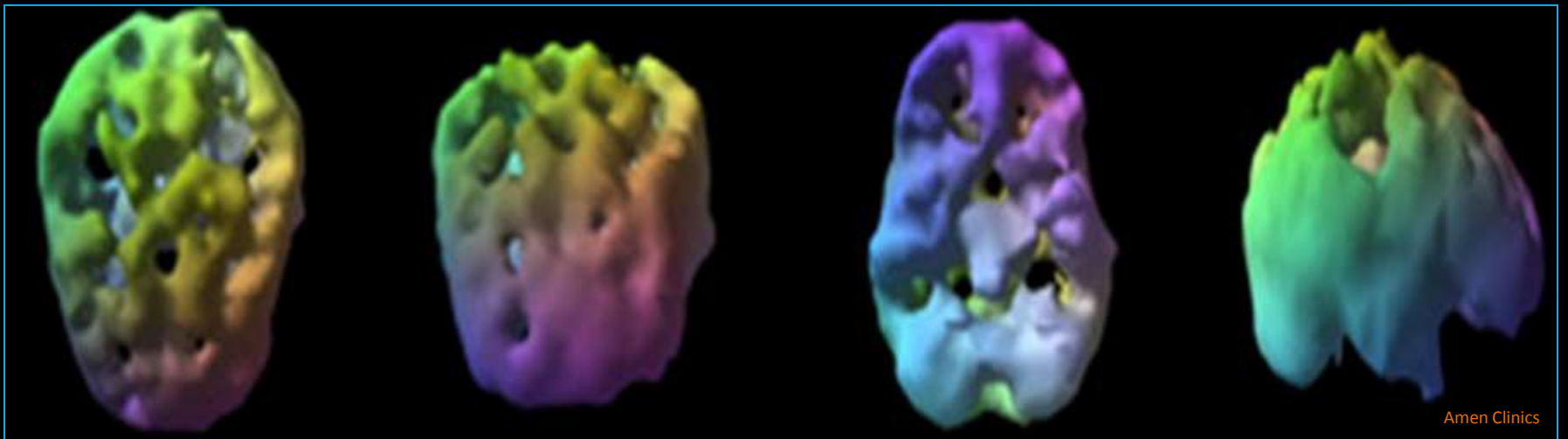
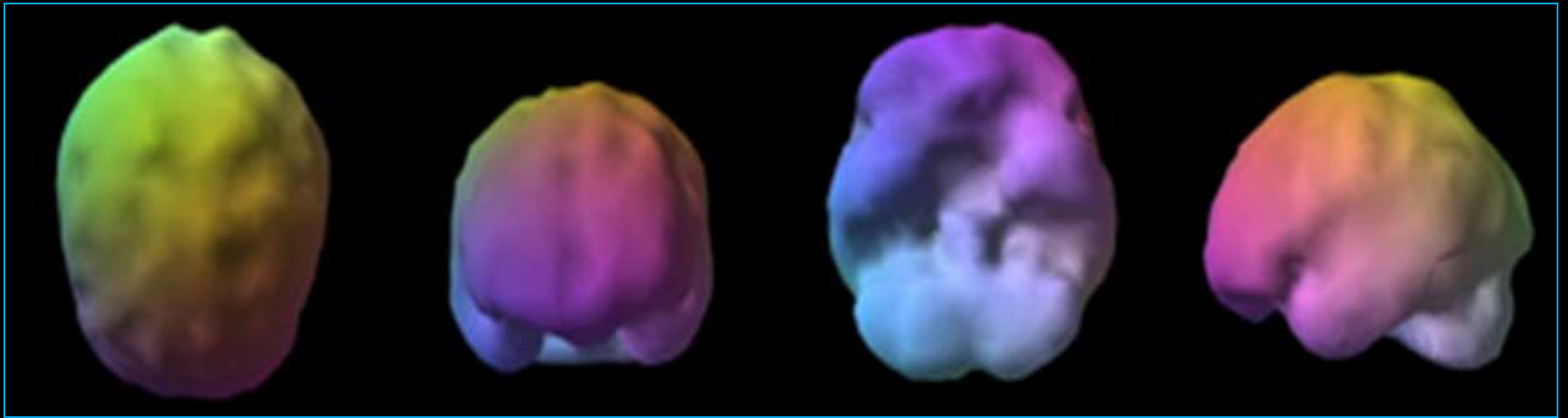


Healthy



Marijuana





Amen Clinics

Take your chances



Positives and Negatives

EVERY CHECK IN THIS COLUMN
WILL HELP YOU MAXIMIZE
YOUR PERFORMANCE:

- ✓ Elevate Blood Glucose
- ✓ Rested (8+ hours of sleep)
- ✓ **Post Training** Nutritional Recovery
- ✓ Non-weight Bearing
- ✓ Rest
- ✓ Refuel
- ✓ Rehydrate
- ✓ Sleep

A SINGLE CHECK IN THIS
COLUMN AND IT IS ALL UNDONE

Marijuana
✓ Alcohol



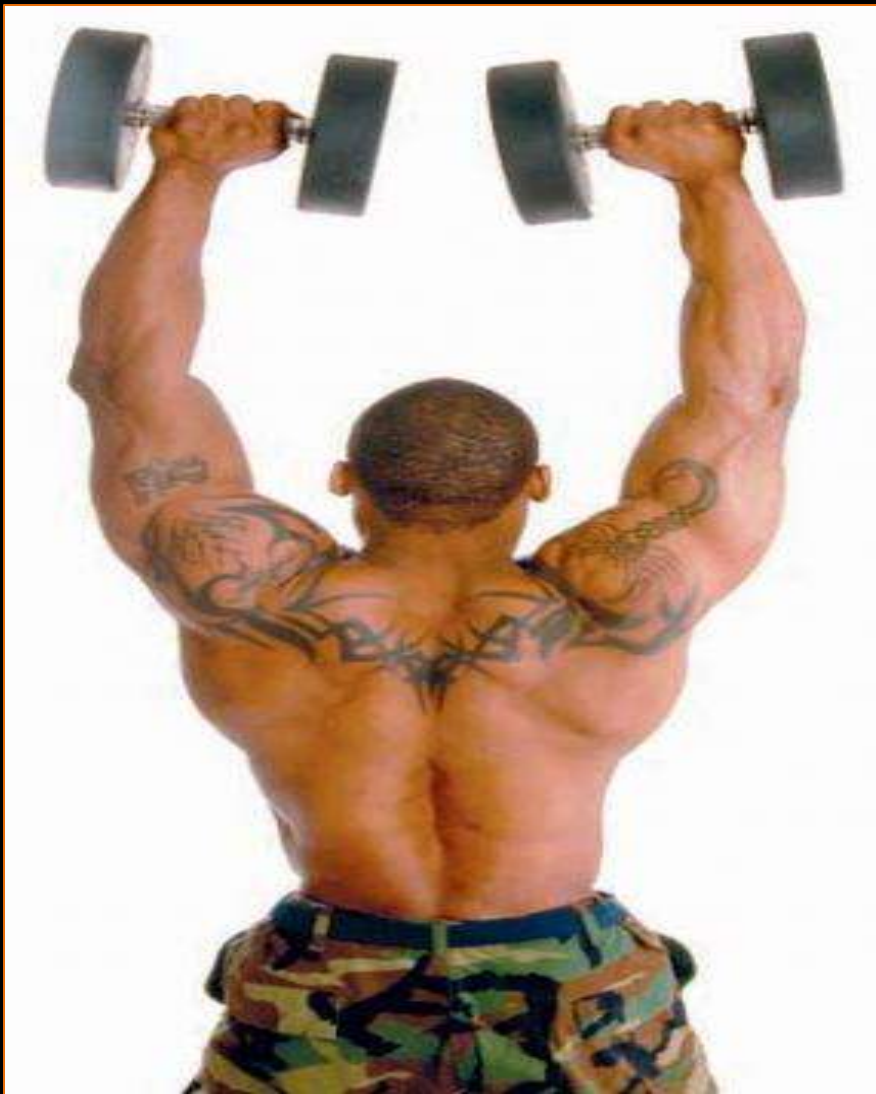
Maximum Results for your effort!





ALCOHOL EFFECTS PHYSICAL/MENTAL





For 24 hours
after heavy
drinking, it is
impossible to
have any
training effect
take place

24 HOURS

DEFICITS





There are
effects from
any amount of
alcohol.
Even one
drink!

PHYSICAL
COGNITIVE



The hangover is just the beginning...



M T W R F S S



Five condensation-covered green beer bottles are lined up on a wire rack. The bottles are identical and appear to be filled with a light-colored beverage. The condensation is most prominent on the lower half of the bottles. A black banner with yellow text is overlaid across the middle of the image.

ALCOHOL UNKNOWNNS

Alcohol is converted to acetaldehyde by the enzyme alcohol dehydrogenase, and then from acetaldehyde to acetic acid by the enzyme acetaldehyde dehydrogenase. Acetaldehyde (ethanal) is between 10 and 30 times more toxic than alcohol itself.



Life ^{of an}
Athlete



10x 20x 30x

ALCOHOL > ACETALDEHYDE



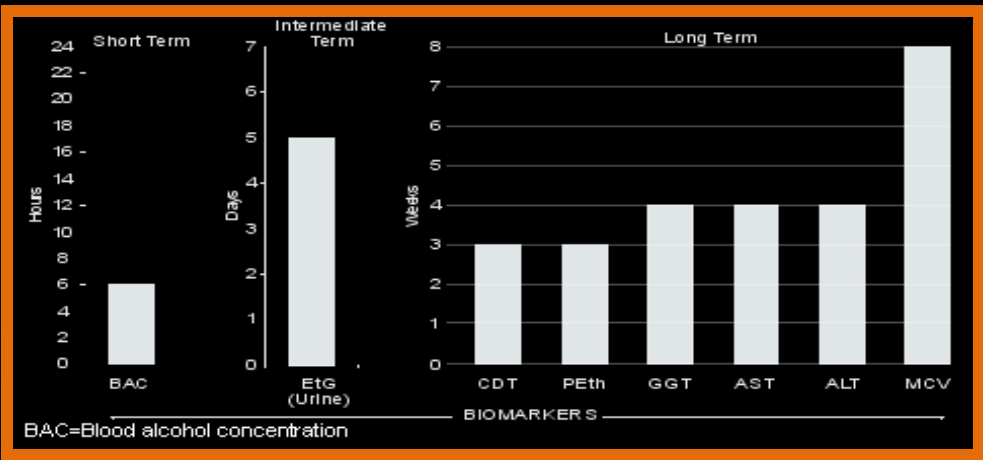


The smallest of
measures

IN URINE



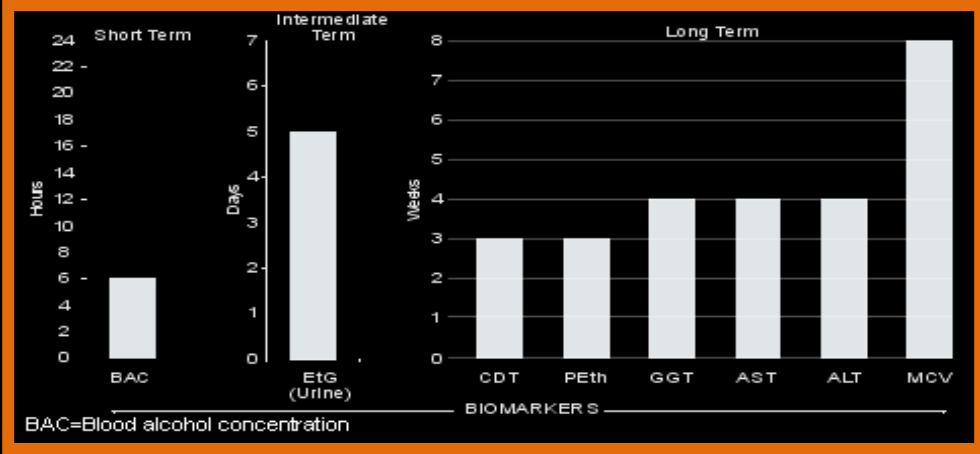
(0.02%) non-oxidative pathway produces ethyl glucuronide (EtG), which is excreted in the urine.



Windows of Assessment for Various Alcohol Biomarkers

4-5 DAYS
80 HRS.





IN BLOOD

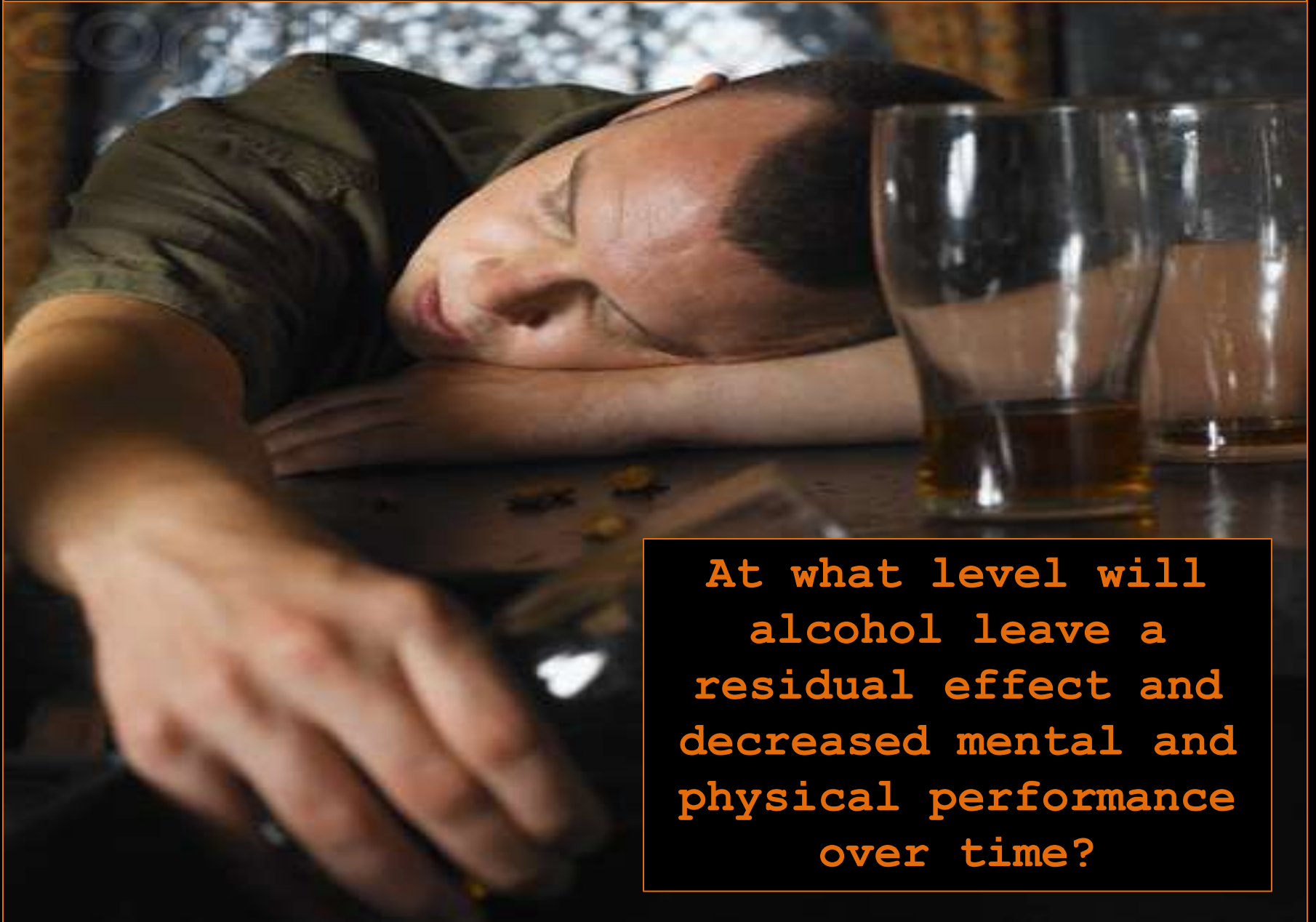
3-8 WEEKS



The more you drink the more you impair brain, body and CNS function.



DECREASED MENTAL PHYSICAL PERFORMANCE



At what level will alcohol leave a residual effect and decreased mental and physical performance over time?



Effects of alcohol begin at 1-2 drinks
Effects increase dramatically at 3-4 drinks
Effects at 5-6 drinks have serious residual effect

RESIDUAL EFFECTS



Minimal

Residual





The residual effect of alcohol or a hangover has been shown to reduce performance by an average of 11.4% in elite athlete populations.

<11.4%

PERFORMANCE POTENTIAL





Cardiac Output
Stroke Volume
Cardiac Arrhythmias

HEART FUNCTION



$< O_2$
 $> CO_2$
 $< VE$



LUNG FUNCTION



HRV



HEARTRATE VARIABILITY





TRAINING HORMONES





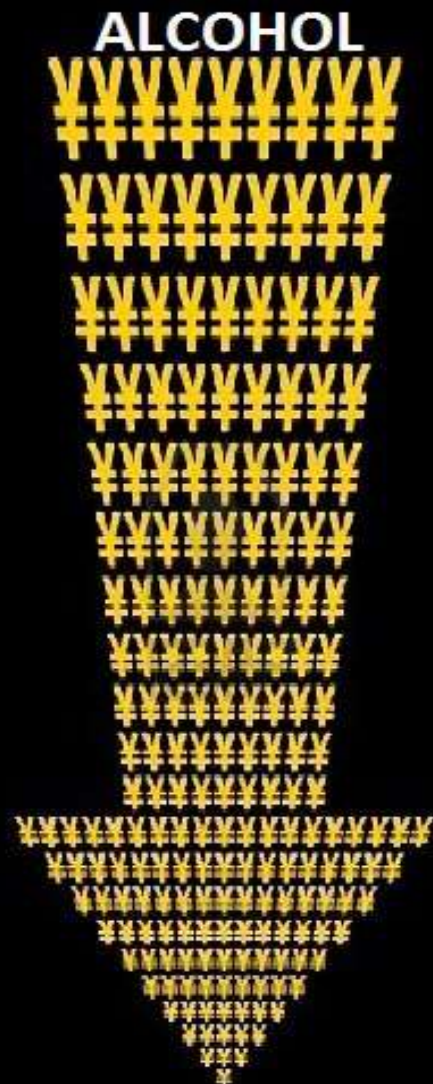
TESTOSTERONE

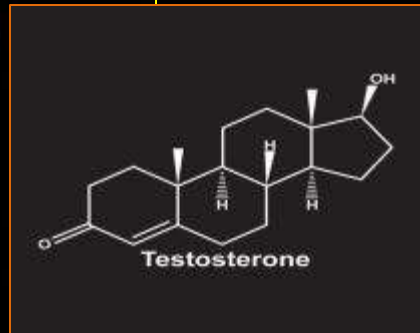
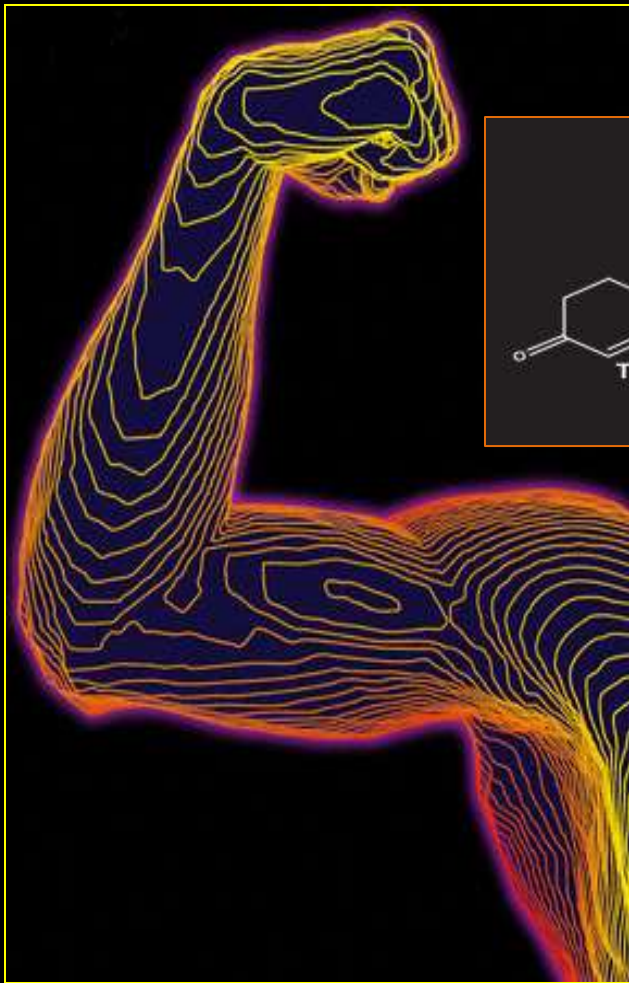
Studies of athlete drinkers have shown that alcohol directly suppresses testosterone levels.

The more you drink, the worse it gets.

And it's not just at the time you are drinking.

The biggest hit comes later, and spills into the following days...





Heavy maximal level training followed by excessive alcohol consumption can result in hormonal disruptions for up to 96 hours (4 days)

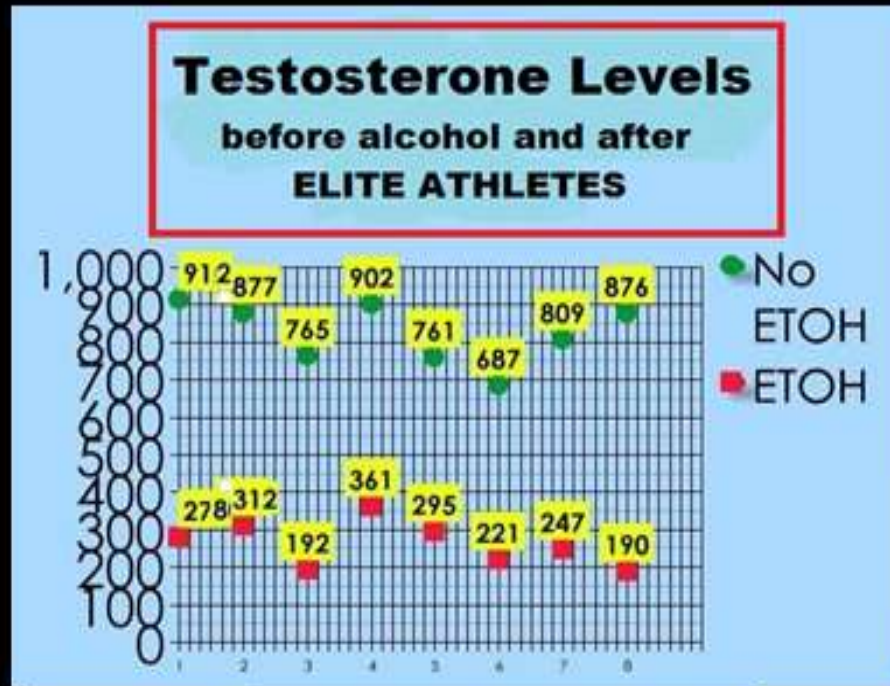
TRAINING EFFECT
RECOVERY
PERFORMANCE

THE 96 HOUR HOLE



(12-20 hours after the start of drinking) the testosterone level was only about half what it was...

It happens fast



TESTOSTERONE



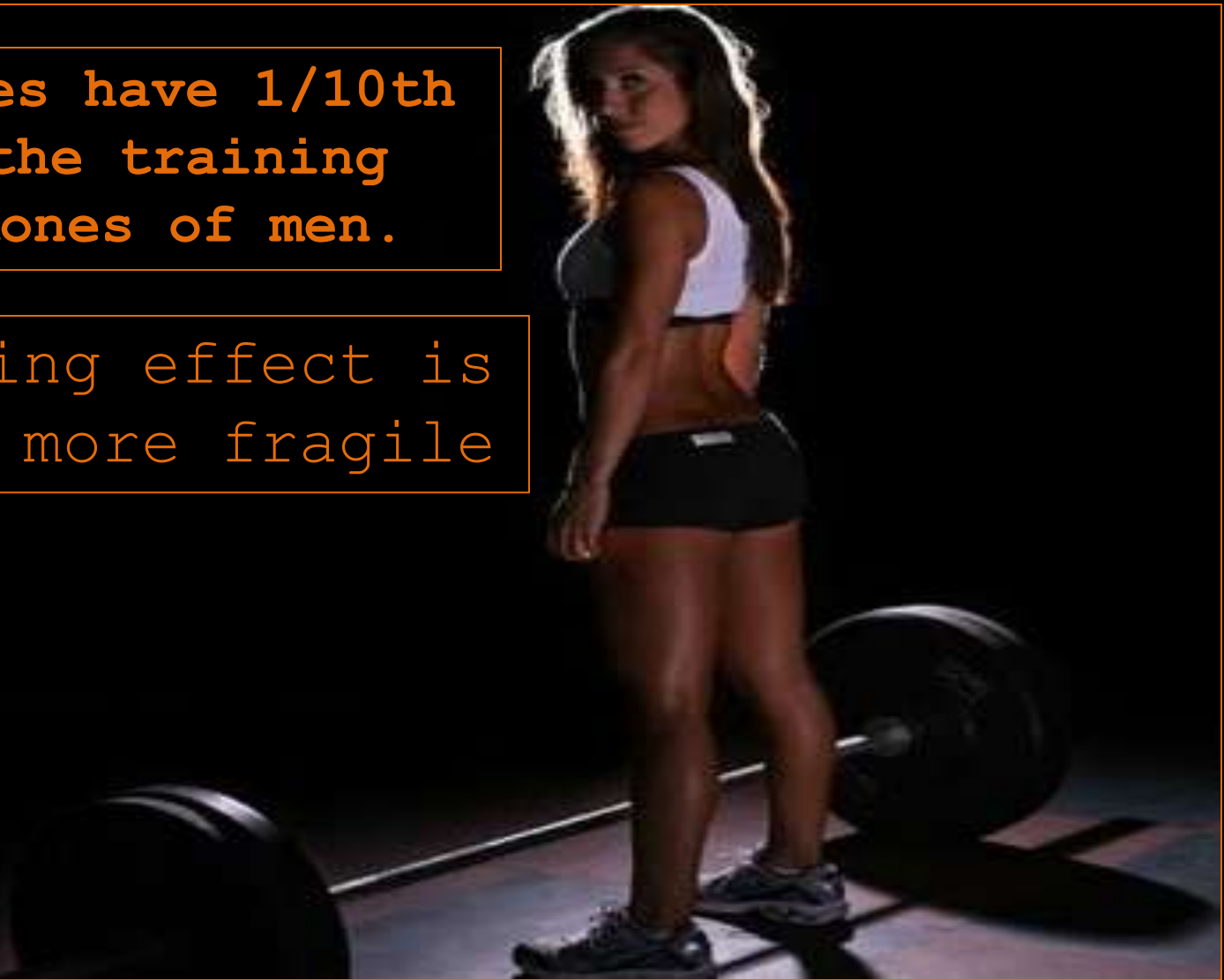
Some males who drink heavily & regularly have testosterone levels similar to female levels.

Alcohol And Testosterone



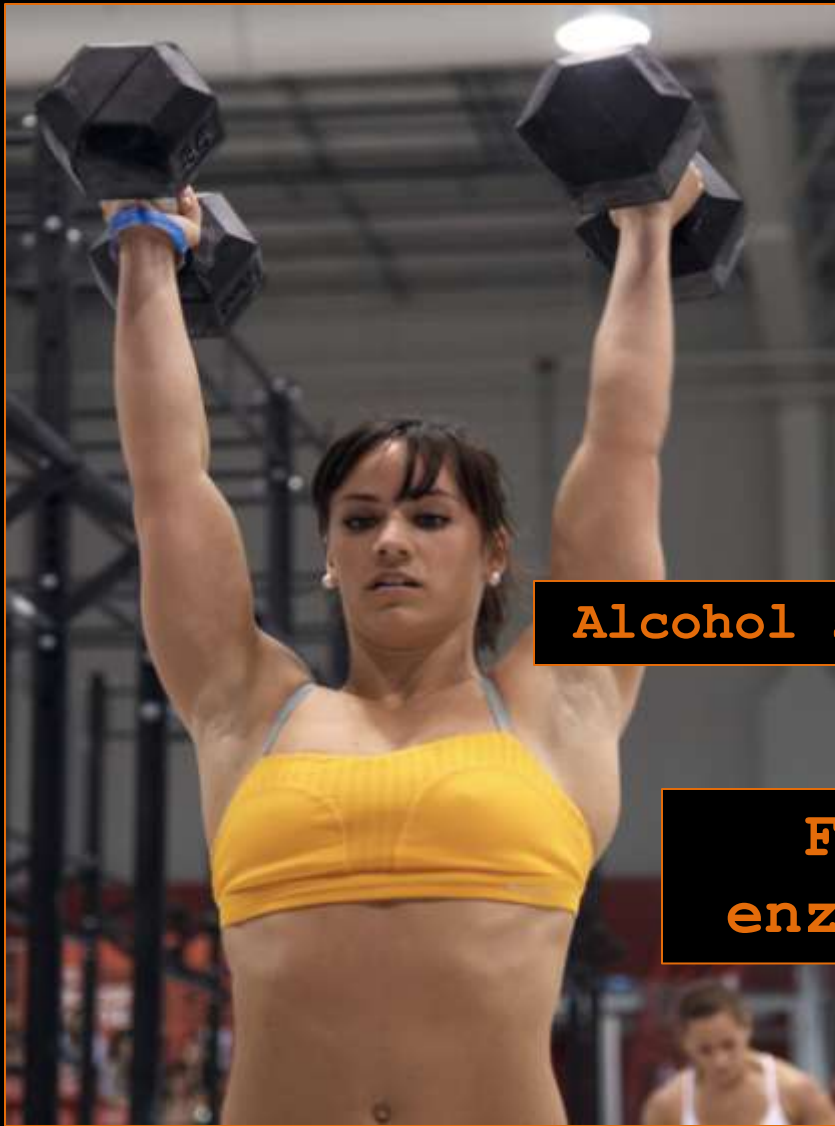
Females have 1/10th
of the training
hormones of men.

Training effect is
much more fragile



Female Training Effect





Alcohol stays in the female body longer

Females have less of the enzymes to breakdown alcohol

Alcohol > affects on females



Alcohol and Sickness

Life of an
Athlete



The impairment of cellular immune response can be attributed to acute alcohol use...

Sickness

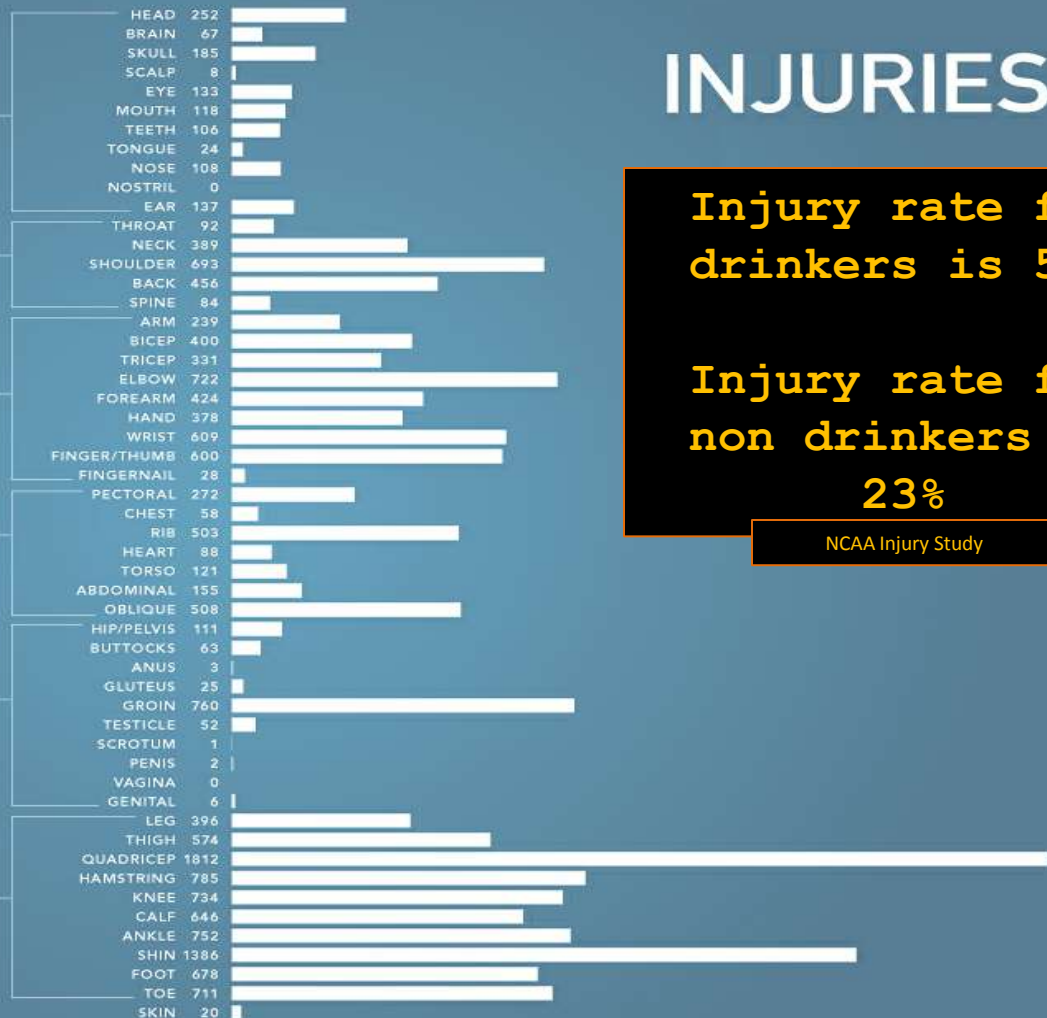
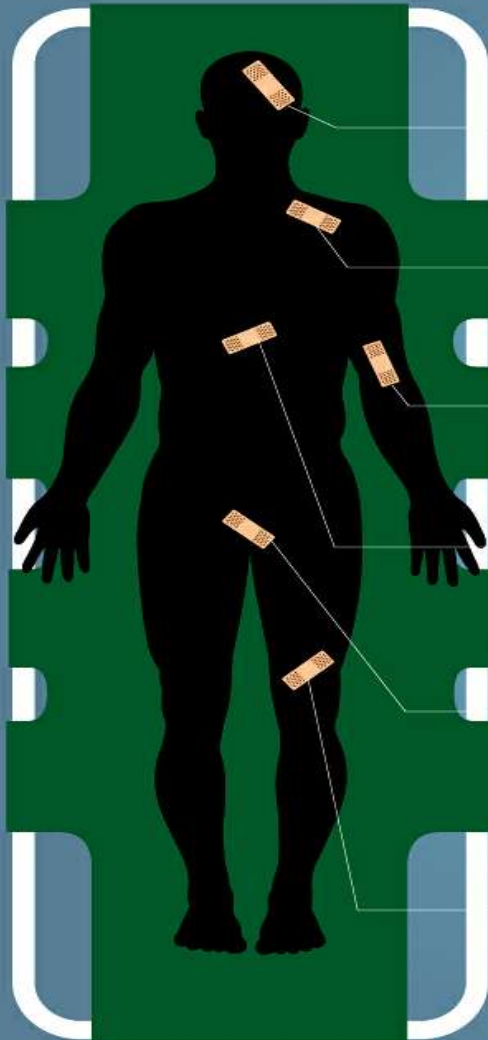


INJURIES

**Injury rate for
drinkers is 54%**

**Injury rate for
non drinkers is
23%**

NCAA Injury Study

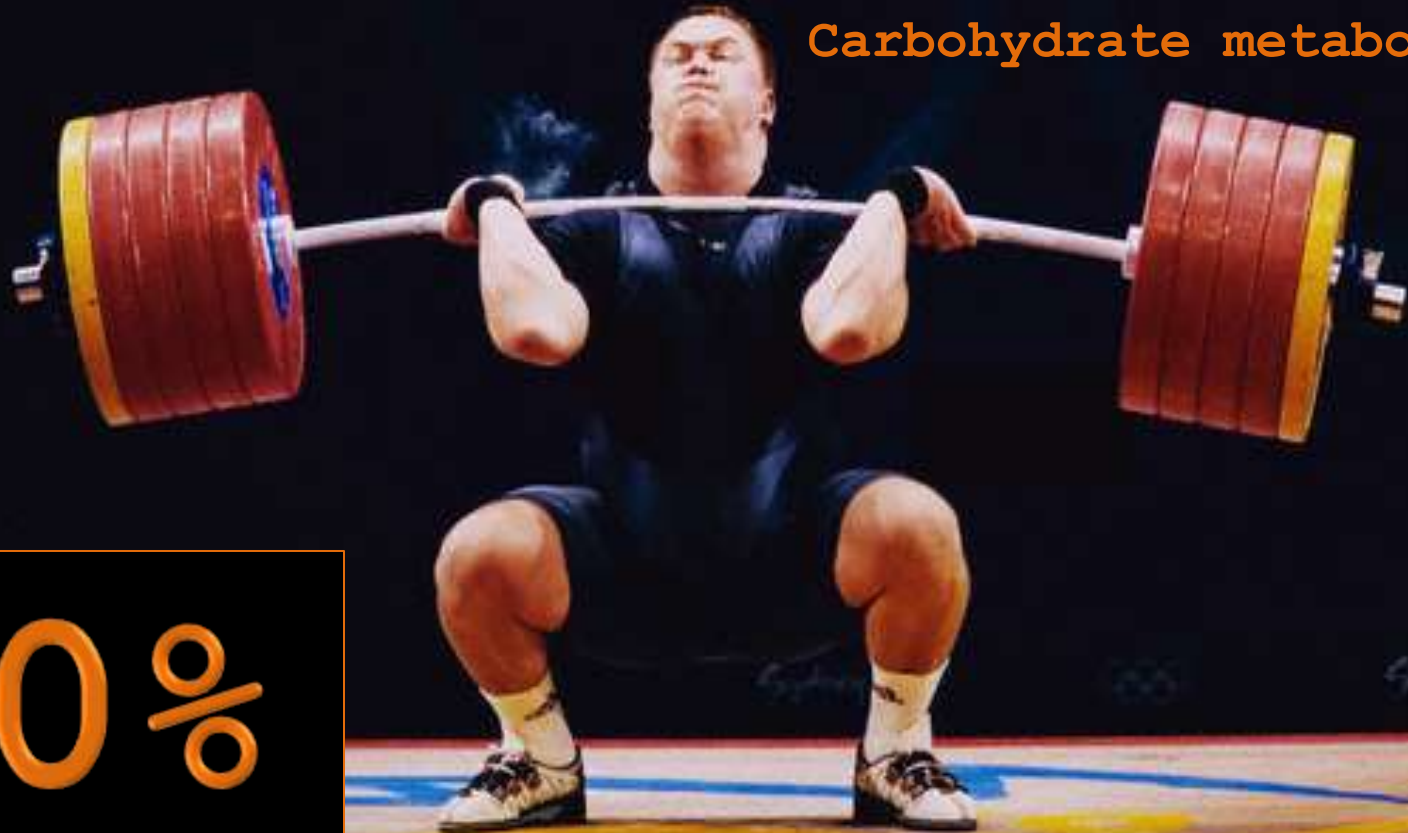


SOURCE: LEXISNEXIS



HGH

Maintains muscle mass
Repairs muscle fiber
Fat metabolism
Carbohydrate metabolism



70%

Human Growth Hormone





STRENGTH/POWER





<11%

EXPLOSIVE POWER





< 8%

POWER ENDURANCE



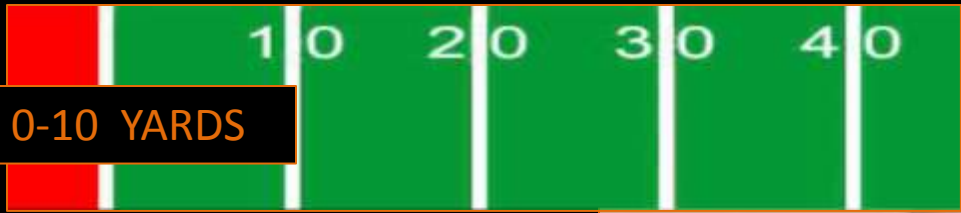


< 6%



ACCELERATION SPEED





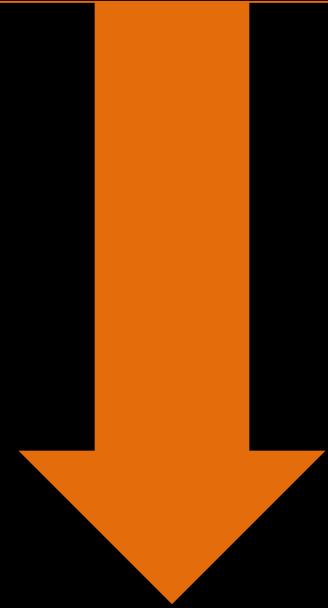
< 8%



START UP SPEED



0-5 yds.



< 8%

LATERAL SPEED



< 6.96%

ENDURANCE





**FAT
BURNING
DECREASED**

**Alcohol
greatly
affects the
amount of fat
your body can
and will burn
for energy!**

Just a mere 24g (less than one ounce) of alcohol consumption showed whole-body fat oxidation (the rate at which your body burns fat) decreased by a whopping 73%!





**1X DRUNK = 14 DAYS
LOST TRAINING EFFECT**

American Athletic Institute has studied the impact of alcohol on condition in elite athletes. Impact has shown significant projections in lost physiological condition that correlates to as much as

14 days of lost training effect...for each time drunk...

WASTING YOUR TIME



Throwing away your hard work?



one night of drinking
wipes out 2 weeks of training

American Athletic Institute study, 2010



Prevention Network

©2009

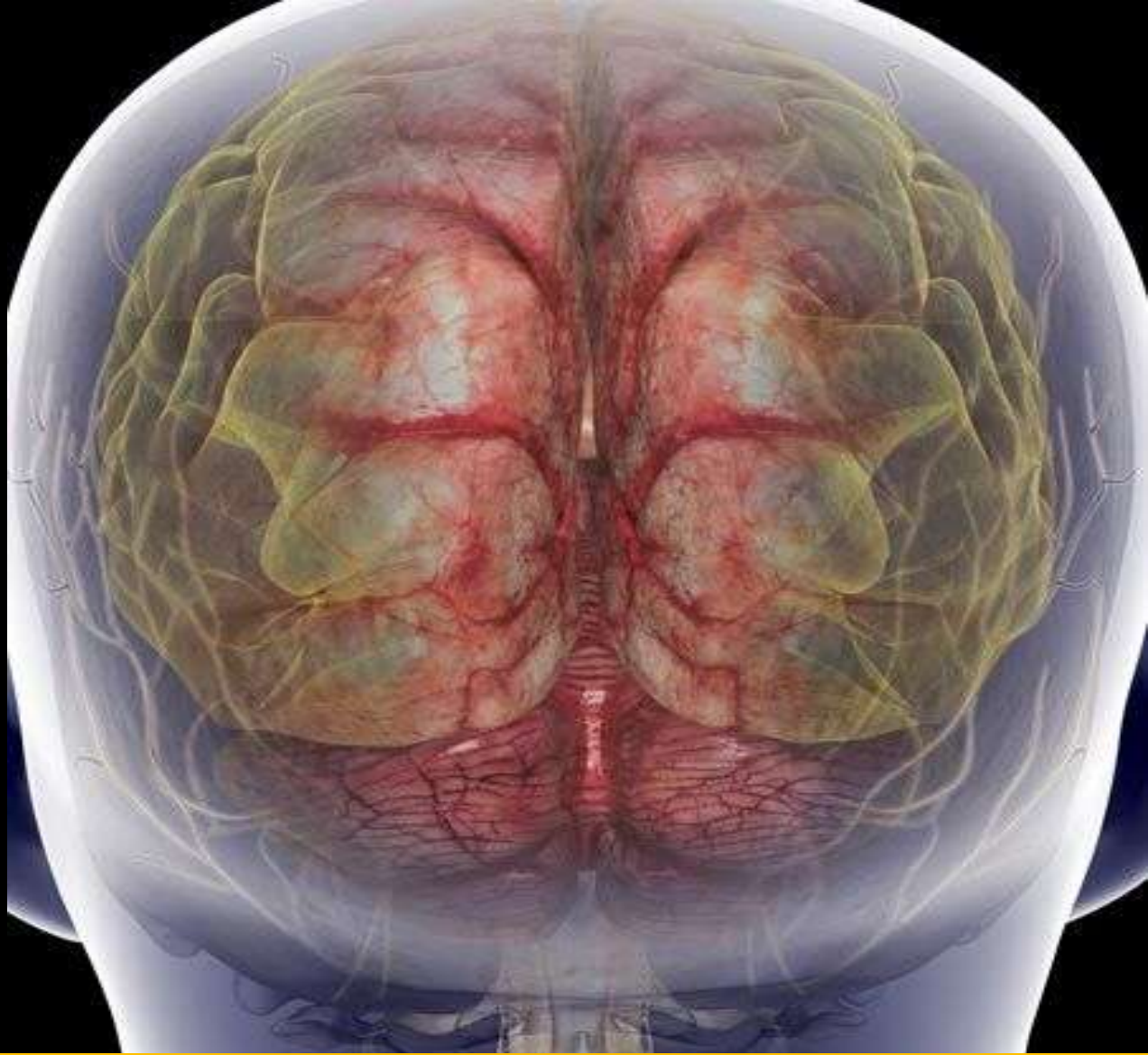
www.PreventionNetworkCNY.org 315-471-1359

design: Gregory Daily

WEED UNKNOWNNS



B R A I N



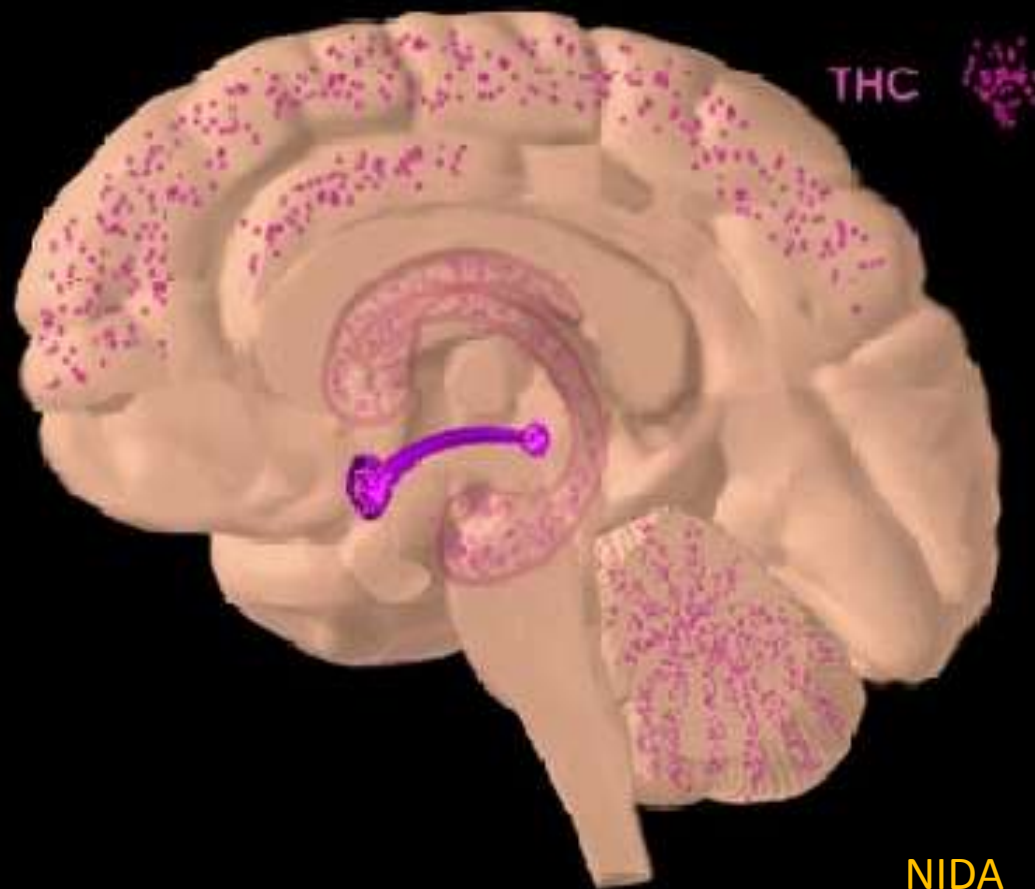
THC attaches to receptors in the brain and impacts learning, memory, reaction, movement and coordination.



Receptors

There are membranes of particular nerve cells in the brain that have special protein receptors called, cannabinoid receptors, that bind with the THC. When the THC binds to these nerve receptors, a series of chemical reactions occur that alter the function of those nerve cells.

Deposit Sites



Cannabinoid Receptors in Brain



memory

cognition

reward

sensory perception

emotions

motor control

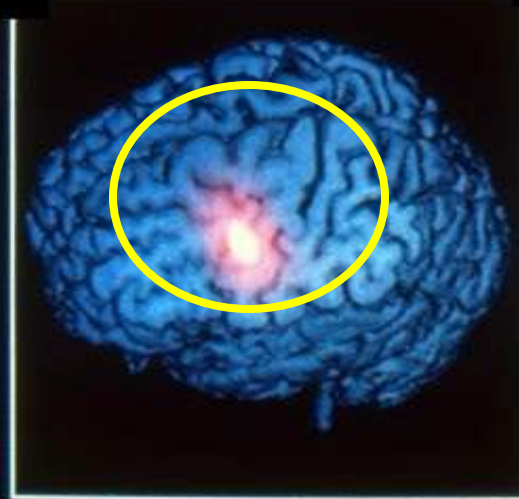
movement memory

coordination

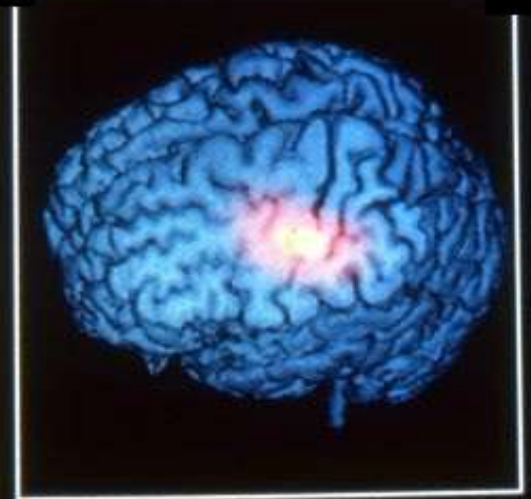
Pre Movement-Movement



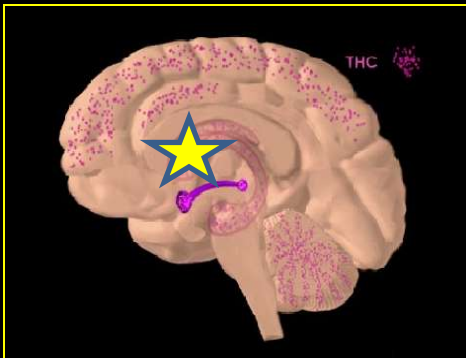
PRE MOVEMENT



MOVEMENT



Two computer images of the human brain (side view), depicting brain to hand nerve control. At left, milliseconds before a patient starts moving their right index finger, nerve cells in the pre movement motor area of the brain (pink) send movement commands to the muscle. At right actual movement area transmitting impulse to muscles.



LOCATOR

Human Movement



Initiation of impulses for movement during finger tapping





MARIJUANA SKILL IMPAIRMENT



Skill
Recall
Area



NON USER

SIMPLE HAND SKILL

MARIJUANA USER

SIMPLE HAND SKILL

Note: Subject not under influence during scan.

POT OR NOT? YOUR CHOICE YOUR GAME

Cannabinoid Receptors 'hot-spots'



MRI scan of cellular cannabinoid reception.
(Image © BBC 2009 -

Brain

Liver

Pancreas

Kidney

Skin

Prostate

Cervix

Testes

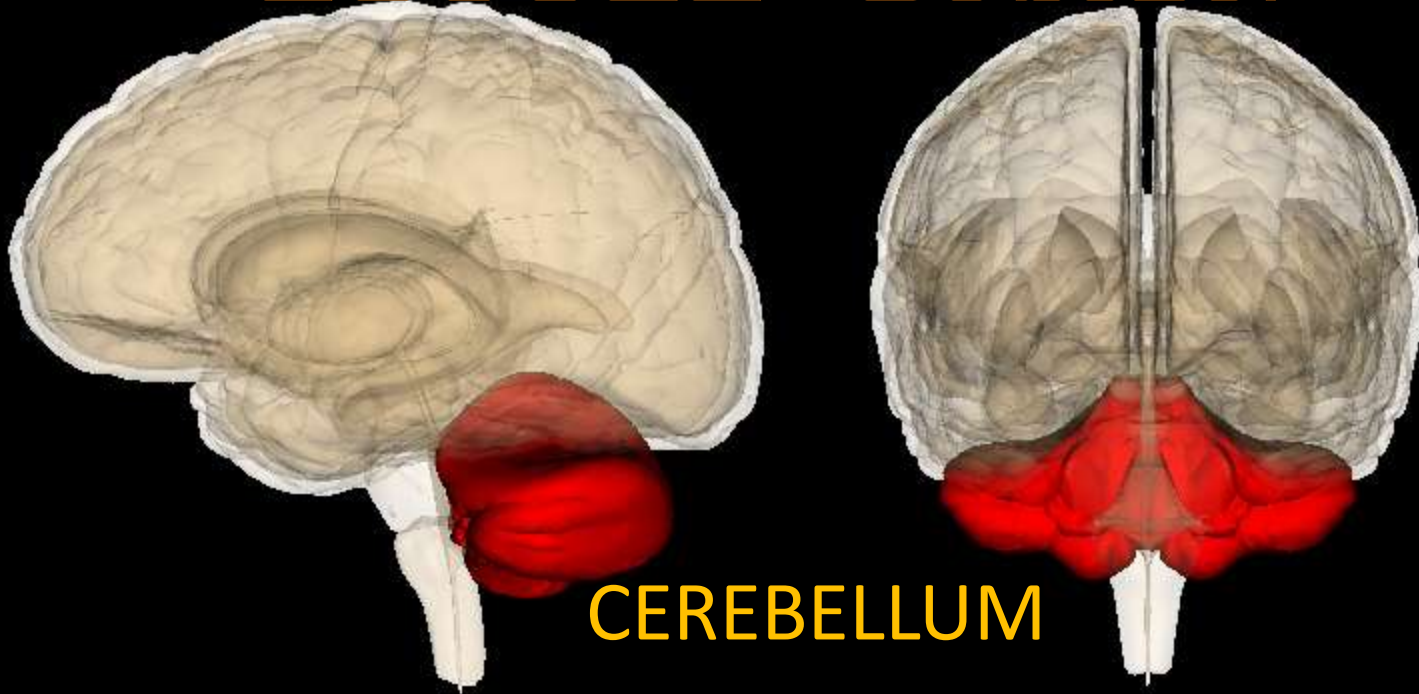
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O

D

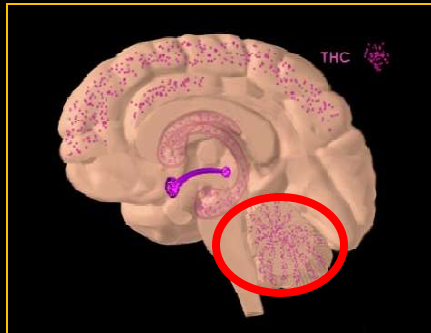
Y

LITTLE BRAIN



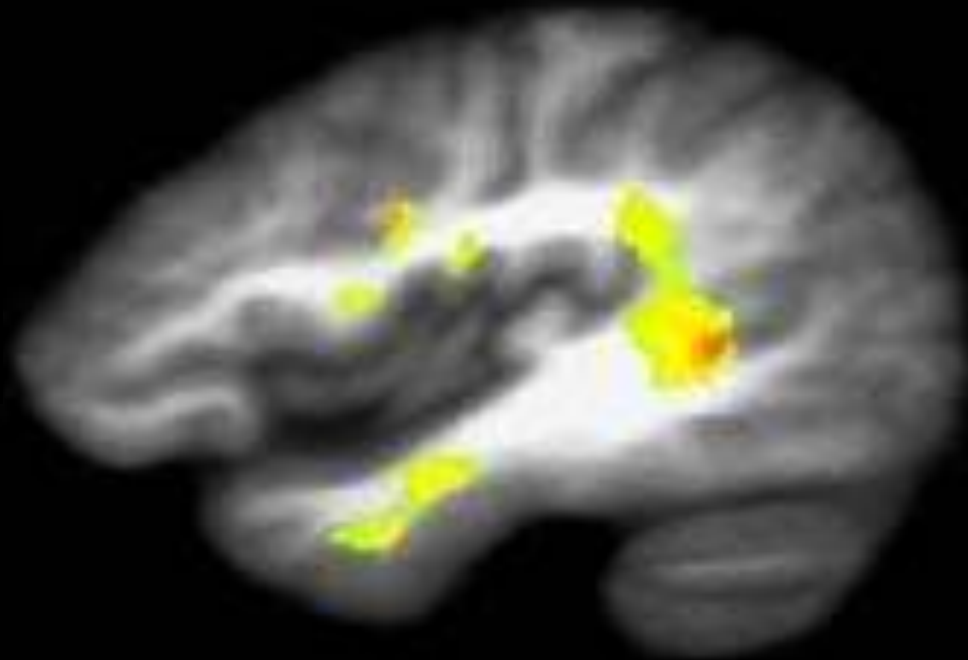
CEREBELLUM

Coordination

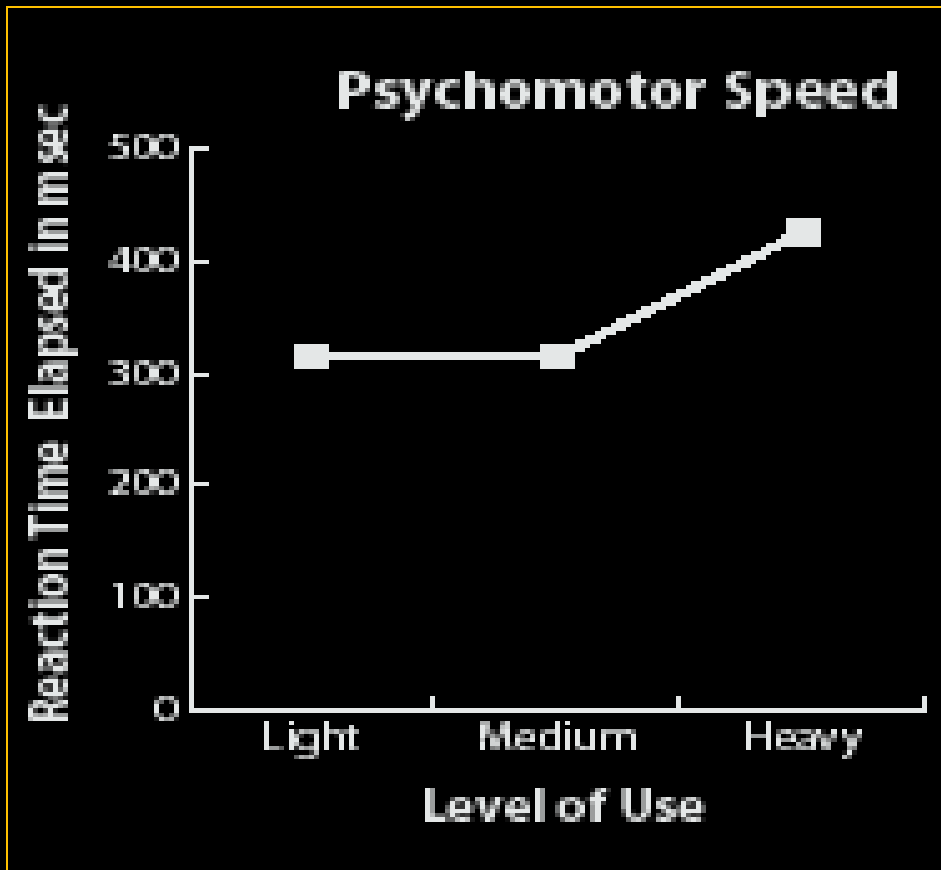


- Equilibrium
- Balance
- Muscle tone
- Ability to perform rapid alternating movements

THINK



WEED and REACTION



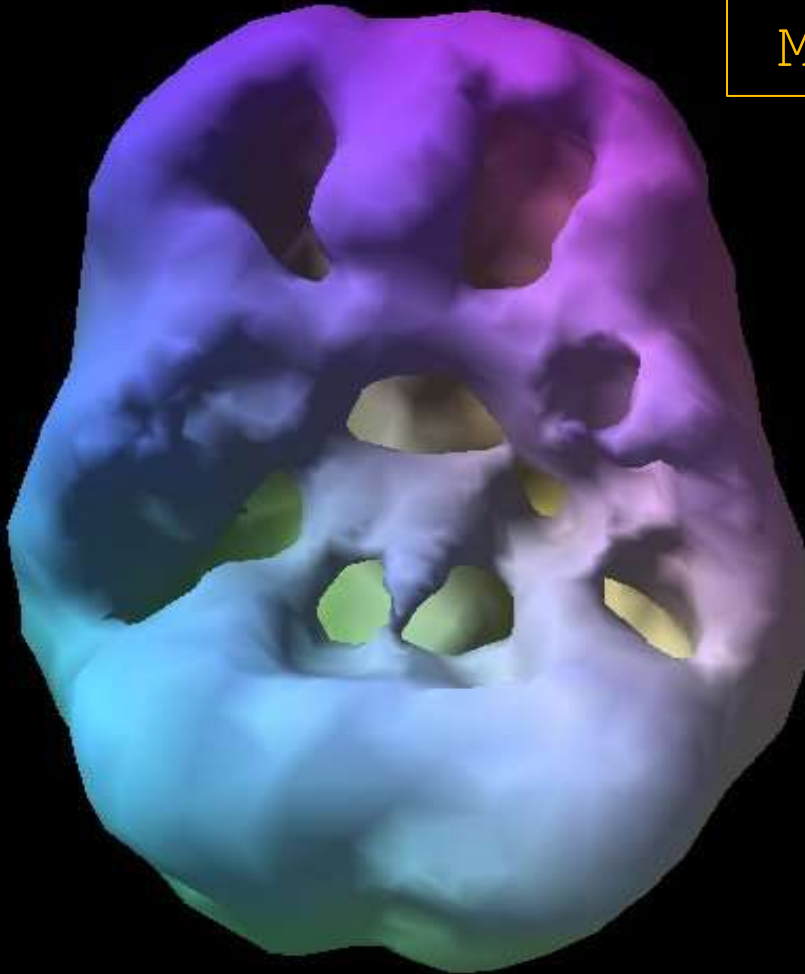
Average in the
.300-.450msec range.



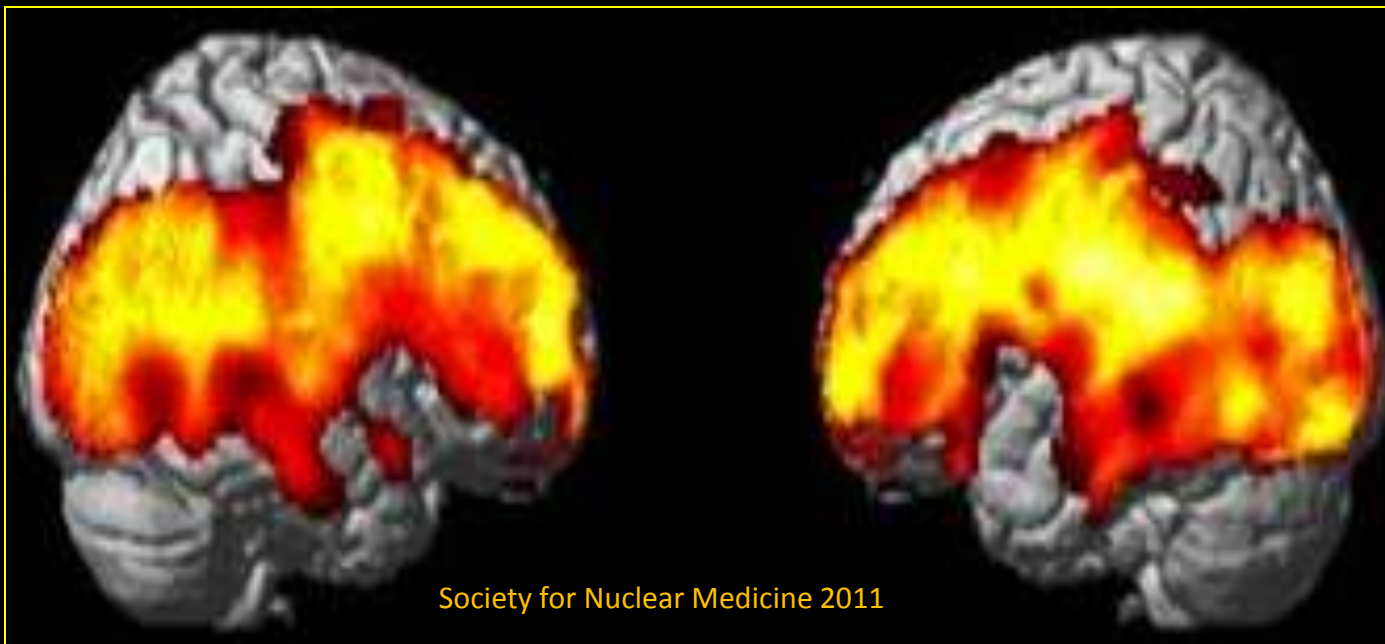
*Highly functional trained athletes
have faster reaction times



Marijuana Regular User



SPECT Scan Amen Clinics



Brain scans showing CB1 receptor down-regulation in the cortex of the human brain (red and yellow color)

Marijuana smokers show a decrease in cannabinoid receptor activity, which correlates with the number of years of cannabis smoking.



The deficits are reversed after just 4 weeks of abstinence...

Life *of an*
Athlete

Change the way you live
and you will change the
way you can compete...

**STOP COMPETING
WITH OTHERS.**
**START COMPETING
WITH YOURSELF.**

