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Hidden Training: **What we don't see and why it matters.**

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"Bridging the Gaps" between the ART, SCIENCE and BUSINESS of coaching.



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No-see-ems are those biting gnats you can barely see, who can pass right through a screen-wire window, and whose bite hurts worse than a mosquito's.


The reason no-see-ems are so common at certain times of the season is that their larvae develop in water, mud and decaying vegetation.

Oh, how their bites can hurt, more than a mosquito's, though they are only a small fraction of a mosquito's size.

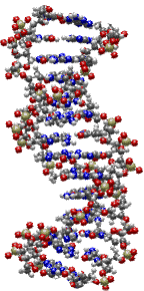


No-see-ems in Training

	Physical Training	Attitude	Nutrition	Sleep	Recovery	Alcohol	Cortisol	GH	Physique	Mental Stress	Immune System
Physical Training							x		x	x	x(cort)
H-Attitude	x									x	
H-Nutrition	x			x	x		x		x	x	x
H-Sleep	x				x(gh)		x	x	x(cort)	x	x
H-Recovery	x									x	
H-Alcohol	x			x				x	x	x	x(sleep)
H-Cortisol	x(*)								x		x
H-GH	x				x				x		
H-Physique	x									x	
H-Mental stress	x	x	x	x	x(*)	x	x		x(cort)		x(cort)
H-Immune system	x			x	x					x	



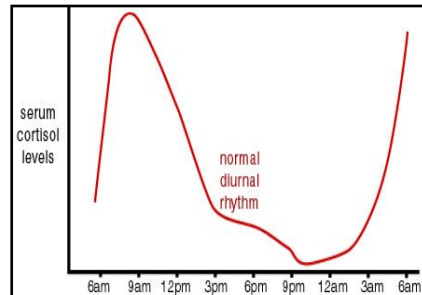
The Hidden Training Revelations:



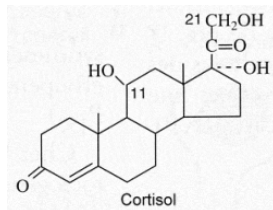
- Everything affects physical training.
- Almost everything affects mental stress.
- Mental stress affects almost everything.
- Nutrition and sleep affect a lot.
- Cortisol is the worst no-see-em.

Cortisol 101

- A stress hormone involved in carbohydrate metabolism and immune function.
- Controlled by adrenocorticotropic hormone (ACTH), which is released from the pituitary gland at the base of the brain.
- Daily rhythmic fluctuation, with levels highest in morning and lowest at night.




*Disruption of rhythms is partially responsible for the feeling of jet-lag.



(aka hydrocortisone)

- Cortisol responds to physical and mental stress.
- Levels are highest during times of stress and during severe illness.
- In stress situations, cortisol maintains blood pressure and limits inappropriate inflammation.
- In the fasted state, cortisol can increase and maintain normal concentrations of glucose in blood.
- A *presence* of cortisol is good.



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Some cortisol supports immunity...

- ✓ Potent anti-inflammatory and immuno-suppressive properties.
- ✓ Important in normal immune responses.
- ✓ Can speed tissue repair.

But prolonged elevations can...

- X Reduce white blood cell production by 38%.
- X Damage the thymus gland which produces these immune cells.
- X Depress the body's immune defense system.
- X Reduce the rate at which lymphocytes (immune cells) multiply.

Did you know...

When cortisol is elevated during the alarm reaction, there is almost a complete disappearance of lymphocytes from the blood. That is why your immune system is suppressed when you are under stress...on the other hand when circulating cortisol is low, its moderating effect on immune reactions is lost and lymphocytes circulate in excess. Remember: too little or too much are both bad.



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Good thing none of us has stress in our lives.

- > Education
- > Cohesiveness
- > Communication
- > Relationships



TRAINING~HEALTH~LIFESTYLE~ENVIRONMENT

Volume, intensity, recovery, taper, technique, competition, colds, fever, GI infection, menstrual dysfunction, sleep, daily schedule, nutrition, housing conditions, leisure activities, family, roommates, teammates, coach, job, school


- > Fitness
- > Technique
- > Nutrition
- > Psychology





EDUCATION - EDUCATION - EDUCATION

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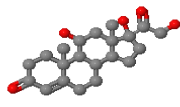



Individuality:

People are biologically 'wired' to react differently to stress.

Therefore...Cortisol secretion varies among individuals.

One person may secrete higher levels of cortisol than another in the same situation.

Prolonged elevations in cortisol can lead to:


- Impaired cognitive performance
- Suppressed thyroid function
- Blood sugar imbalances such as hyperglycemia
- Decreased bone density
- Decrease in muscle tissue
- Elevated blood pressure
- Impaired immunity
- Reduced inflammatory response
- Increased abdominal fat


Did you know...

IF you secrete higher levels of cortisol in response to stress...

You MAY also tend to eat more...

Compared to people who secrete less cortisol.





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Nutrition? Stressful???

w.r.t. Training.

- Eat foods that *support* daily training requirements in terms of total energy, fuel sources and metabolic catalysts.
- Cover the basics of variety, color, timing, carbs, protein, and fluids, and extend this to recovery.

w.r.t. Recovery.

- Take advantage of the post-exercise insulin response to replenish glycogen, attenuate tissue breakdown and promote tissue accretion.
- 20-40 grams carb plus 10-20 grams protein within 20-30 min of workout; Followed by a mixed meal.

w.r.t. Cortisol.

- Insufficient carbohydrate can lead to elevated cortisol.
- 6-10 grams/kg body weight. 130 lbs: 354-590 grams; 190 lbs: 516-860 grams.

w.r.t. Physique.

- Balance calorie intake with training expenditures.
- Time calorie intake to maximize use and storage.
- Obtain calories from sources that enhance metabolism and minimize waste and unnecessary hormonal responses.

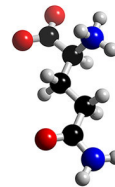
w.r.t. Mental stress.

- Address / overcome nutrition and food related challenges that can increase mental stress.



w.r.t The Immune System

- Adequate carbohydrate intake maintains glycogen stores and therefore plasma/muscle *glutamine*. *Glutamine* is a fuel source for immune system cells.
- Adequate carbohydrate intake keeps glutamine levels higher during intense training and helps return levels to normal after exercise.
- Adequate carbohydrate intake also attenuates the cortisol response to exercise.
- Note: Carbohydrate during exercise is used to maintain blood sugar levels, not for glutamine synthesis.
- A diet low in carbohydrate *and* high in protein may create a condition of acidosis, which requires buffering with glutamine, reducing its availability and increasing susceptibility to infection.
- Supplemental glutamine will not be effective... It only prevents muscle breakdown for glutamine and preserve immune cell integrity in very extreme exercise conditions.



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