

# Overtraining – Causes, Recognition, and Prevention

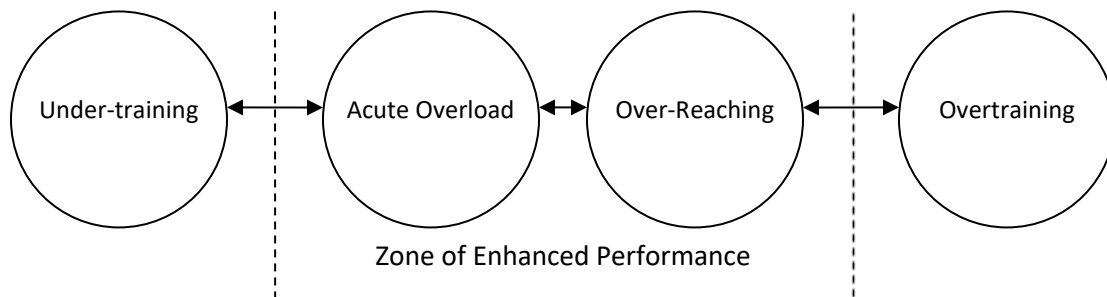
A Presentation by Randall L. Wilbur, Ph.D. - Head of the Athlete Performance Lab,  
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Randy Wilbur, with his extensive education and hands-on experience with many of the country's top athletes, delivered an engaging and informative presentation on Overtraining. To keep this brief, I'll highlight his key points and recommendations.

## Understanding Stress Phases

Wilbur began by defining Over-reaching versus Overtraining. He then outlined the symptoms of overtraining, detailed the physiological models of overtraining, and provided strategies for preventing it.



He identified four distinct "Stress Phases":

1. Under-Training – Produces only minor physiological adaptation and no performance improvements.
2. Acute Overload – Produces positive adaptations with minor performance improvements.

3. Over-Reaching – The "desired Stress Phase" that produces optimal adaptation and significant performance improvements. It's also where athletes are closest to crossing into Overtraining.

4. Overtraining – The phase to avoid, as it leads to a condition that takes weeks or months to recover from.

The goal for elite athletes is to stay in the "Zone of Enhanced Performance," which includes the Acute Overload and Over-reaching Phases. The challenge is to remain in this zone without crossing into Overtraining.

### Recognizing Overtraining

Wilbur provided a comprehensive list of symptoms that indicate an athlete might be approaching or experiencing Overtraining. These symptoms span various categories, including performance changes, physiological responses, immunological responses, biochemical markers, and psychological changes. The combination of a few of these symptoms suggests the onset of Overtraining, underscoring the importance of monitoring daily metrics like weight, fatigue, stress, sleep quality, hours of sleep, and resting morning pulse.

Monitoring these metrics and tracking changes from recommended baseline blood tests can help catch Overtraining early enough to make appropriate adjustments and potentially save an athlete's season. Unlike Over-reaching, which is reversible with proper recovery, Overtraining is a severe condition that takes much longer to recover from.

### Causes of Overtraining

Identifying the causes of Overtraining is challenging because there is no single cause or physiological marker. Wilbur emphasized that at some point, or under some training stress load, Over-reaching turns into Overtraining. This reality highlights the critical need for careful monitoring of athletes.

### Physiological Models of Overtraining

Dr. Wilbur discussed five distinct Physiological Models of Overtraining:

1. Glycogen Depletion
2. Immunosuppression
3. Autonomic Nervous System Imbalance
4. Central or Overall Fatigue
5. Elevated Cytokine Levels

While a detailed discussion of these models is beyond the scope of this article, it's important to note that these factors play a significant role in the development of Overtraining.

### Preventing Overtraining

In the final part of his presentation, Dr. Wilbur provided recommendations to help athletes avoid Overtraining while still pushing hard enough to reach their highest performance levels. Here are his key recommendations:

1. Follow a Scientifically Sound Periodized Training Program

Ensure your program includes properly timed and structured tapering strategies for key competitions.

## 2. Keep Detailed Records and Monitor Your Training Response

Track daily metrics such as sleep, weight, stress levels, and recovery to gauge how your body is responding to training.

## 3. Follow a Strict Nutrition Plan

Your diet should be high enough in carbohydrates to meet your reloading needs, include adequate protein, and incorporate a therapeutic dose multivitamin that includes antioxidants, B-complex vitamins, trace minerals, and iron. Many of the physiological models of Overtraining Wilbur discussed start with inadequate carbohydrate levels or timing.

*Authors Note: While inadequate carbohydrate levels or timing may negatively affect glycogen replacement initially, appropriate reduction of carbohydrate intake has proven to provide increases in fatty acid oxidation, which is a preferred metabolic adaptation in both aerobic sports and in metabolic health. It has also been shown that chronic excessive carbohydrate consumption has many negative health benefits. Also not mentioned by Dr. Wilbur was appropriate hydration and electrolyte consumption.*

## 4. Monitor Biochemical Markers

Use baseline and periodic blood tests to track changes in biochemical markers. Consult with a coach or medical professional for more information.

## 5. Follow Practical Guidelines for Training While Ill

If you experience non-systemic symptoms, submaximal exercise may be acceptable. However, during systemic illness (e.g., fever, muscle aches, swollen lymph glands, extreme fatigue), avoid both submaximal and maximal exercise.

## 6. Improve and Add Recovery Techniques to Your Program

Prioritize passive rest (sleep), and consider adding hydrotherapies (e.g., water running, cold water immersion, contrast temperature baths), sauna, and massage. Monitor body weight and urine color to avoid dehydration.