

Interval Training

To Improve Energy System Development

Experts suggest that interval training is the most appropriate method of training for improved energy system development (ESD)¹. This method of training involves alternating predetermined periods of work at specific intensities, with periods of rest (inactivity) or recovery (low intensity activity) for a given amount of time or repetitions. Because most sports demand alternating periods of work and rest, this type of training can be highly sport specific and therefore beneficial in improving performance.

You can create your own interval training program based on the specific demands of your sport and the goals you wish to achieve. But first you must have a general understanding of the energy systems that play a role in your sport. Here is a quick review of the three energy systems responsible for providing your body with fuel for activity.

The phosphagen system fuels activity that is very short (<30 seconds) and intense. It is called into play at the beginning of all activities.

The glycolytic system provides energy for intense to moderately intense activities that last longer than 30 seconds and up to about three minutes.

The aerobic system fuels activity of low to moderate intensities for longer than three minutes.

Keep in mind that these energy systems do not work in isolation. One energy system may dominate and at times systems overlap and/or alternate.

Follow the steps below to determine the energy systems that are involved in your sport and create your own interval training program based on the specific demands of your sport.

Step 1

Assess your sport's intensities.

Intensity is the first factor that determines which energy system comes into play during activity¹. Most sports require athletes to work at varying intensities. That is, sometimes all out effort is demanded and at other times more moderate effort is demanded. Periods of rest are included as well. Identify the ranges of intensities demanded from your sport. Very high intensity signifies all out effort. Moderate intensities require medium degrees of effort and low intensity requires minimal efforts.

Step 2

Identify work-to-rest ratios.

Duration is the second factor that determines which system is responsible for providing energy during activity¹. It

can be difficult to characterize typical work-to-rest ratios in most sports, as the nature of sport makes them highly unpredictable. Do your best to determine a range in the length of time you are active in the intensities you've already identified. Also determine a range in the length of time you are able to rest or recover during activity.

Step 3

Replicate the energy system demands to create a defined training regime.

Once you have determined the intensities and work-to-rest ratios involved in your sport you will be able to recognize the energy systems that are in use in your sport and reproduce the demands of your sport. Simply create a series of work-to-rest ratios at specific intensities that reflect the information you have already obtained. Here are a few tips that may be helpful.

Interval training tips

Rest periods affect intensity.

It may seem that the work periods of your program determine how hard your workout will be. However, the amount of rest you have can be a greater determinate of overall training intensity. Shortening your rest periods requires your energy systems to recover quicker. If you begin your next interval bout without sufficient recovery from the previous bout, the accumulation of training stress can create fatigue. As a general guideline, if you are a beginner keep rest periods longer than work periods. As training becomes more tolerable, decrease the rest periods gradually. Highly trained individuals may keep rest periods very short to increase the training challenge during specific training periods.

Include sport specific movements.

With the exception of water sports, most sports rely on running as a means of locomotion. However, few sports solely involve running straight ahead for a given period of time. Be sure to include change of direction and any sport specific movements like shuffling or backpedaling where appropriate.

Follow basic periodization guidelines.

Interval training can be an intense but beneficial form of training. In order to prevent overtraining or injury, keep in-season training at lower volumes and fewer times per week. In the off-season increase the volume of interval training and add general forms of energy system development as appropriate. ▲

References

1. Baechle TR, Earle RW (Eds.). (2004). *Essentials of Strength Training and Conditioning (2nd ed.)*. Champaign, IL: Human Kinetics.

About the Author

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