Does the Time of Day Affect Athletic Performance?

Performance athletes and exercisers work out at all times of the day and night, often more than once. For those who have a choice about when they exercise, the time of day’s effect on performance could mean the difference between poor, average and better-than-average results. Exercise scientists have known for a long time that most physiological variables demonstrate predictable, rhythmic changes within the 24-hour day. For example, body temperature is lower during the early morning hours and progressively increases during the waking hours. The fluctuation of any variable within the 24-hour day is referred to as a circadian rhythm. Changes in a variable are often described as "time of day" or "chrono-biological" variations. Because we do not exercise during normal sleeping hours, the focus here was on variation in exercise performance during the segment of the day in which activity typically occurs between 8:00 AM and 8:00 PM. (Note: Refer to previous article on jetlag . . . biorhythms)

10-12 Minute Aerobic Capacity
In tests lasting 10-12 minutes used to determine maximal aerobic exercise capacity, no fluctuation was evident during normal waking hours - morning, afternoon, or evening. Neither time until exhaustion nor maximal oxygen uptake varied according to the time of day. Even during longer tests of steady, submaximal intensity, exercise duration was about the same in the both morning and afternoon sessions.

2-3 Minute High Intensity
In physical performance that relied mainly on the anaerobic system to provide energy - high energy, short duration - the time of day may or may not have an effect. In all-out exercise of 2-3 minutes, performance may be impaired more in the morning than in the afternoon. However, when testing maximal effort during cycling for less than one minute, performance does not differ based on time of day.

Muscular Strength and Flexibility
Most of the literature indicates that muscle strength varies significantly based on time of day. Strength performance is less impressive before noon than in mid-afternoon and early evening. When strength is measured with a device that controls for speed of limb movement (isokinetic exercise), time of day changes are most pronounced at faster speeds. Muscle strength may be greater later in the day because body temperature is also higher at this time. The gradual increase in body temperature also contributes to greater flexibility. These findings suggest that not only is greater strength performance more likely in the afternoon, but resistance to muscle injury may also be greater at that time.

Resistance Training
There is some evidence that male hormonal responses to resistance training are strongest in the morning. In addition, after an exercise session testosterone levels are higher in the morning than later during the day. Although in contrast to strength performance, muscle-building potential of weight lifting may be at its best before noon.

Endurance Training
Endurance athletes perform best at the time of day at which they normally train. However, variations based on time of day are less apparent in middle-aged athletes than in younger ones. Some studies have shown that even among non-athletes, older individuals have a better capacity to adapt to physical, psychological, and mental variables. Adhering to exercise and fitness programs seems to be the highest among those who work out in the morning.

Consider
What time do you train and what time do you play? Does it matter? Is specificity as issue?