

# The Effects of Sleep Extension on the Athletic Performance of Collegiate Basketball Players

## **Study Objectives:**

To investigate the effects of sleep extension over multiple weeks on specific measures of athletic performance as well as reaction time, mood, and daytime sleepiness.

## **Setting:**

Stanford Sleep Disorders Clinic and Research Laboratory and Maples Pavilion, Stanford University, Stanford, CA.

## **Participants:**

Eleven healthy students on the Stanford University men's varsity basketball team (mean age  $19.4 \pm 1.4$  years).

## **Interventions:**

Subjects maintained their habitual sleep-wake schedule for a 2–4 week baseline followed by a 5–7 week sleep extension period. Subjects obtained as much nocturnal sleep as possible during sleep extension with a minimum goal of 10 h in bed each night. Measures of athletic performance specific to basketball were recorded after every practice including a timed sprint and shooting accuracy. Reaction time, levels of daytime sleepiness, and mood were monitored via the Psychomotor Vigilance Task (PVT), Epworth Sleepiness Scale (ESS), and Profile of Mood States (POMS), respectively.

## **Results:**

Total objective nightly sleep time increased during sleep extension compared to baseline by  $110.9 \pm 79.7$  min ( $P < 0.001$ ). Subjects demonstrated a faster timed sprint following sleep extension ( $16.2 \pm 0.61$  sec at baseline vs.  $15.5 \pm 0.54$  sec at end of sleep extension,  $P < 0.001$ ). Shooting accuracy improved, with free throw percentage increasing by 9% and 3-point field goal percentage increasing by 9.2% ( $P < 0.001$ ). Mean PVT reaction time and Epworth Sleepiness Scale scores decreased following sleep extension ( $P < 0.01$ ). POMS scores improved with increased vigor and decreased fatigue subscales ( $P < 0.001$ ). Subjects also reported improved overall ratings of physical and mental well-being during practices and games.

## **Conclusions:**

Improvements in specific measures of basketball performance after sleep extension indicate that optimal sleep is likely beneficial in reaching peak athletic performance.

