

Light exposure in the evening improves performance in the final spurt

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Athletes in blue light: Performance during the final spurt is clearly increased by light exposure. Credit: University of Basel, Department of Sport, Exercise and Health

Athletes often have to compete late in the evening, when they are no longer able to perform at their best. As reported in the journal *Frontiers in Physiology*, however, researchers from the University of Basel have shown that athletes who are exposed to blue light before competing can significantly increase their performance in the final spurt. The blue light had no impact on the athletes' maximum performance.

Many sports events take place late in the evening, during television prime time. At this time of day, however, many athletes often fail to perform at their best due to their [sleep-wake cycle](#). In a study headed by Professor Arno Schmidt-Trucksäss, Raphael Knaier and colleagues at the University of Basel investigated whether light exposure before a cycling time trial can compensate for this disadvantage. The Sports and Exercise Medicine division, as well as Professor Christian Cajochen at the Centre for Chronobiology, took part in this extensive investigation involving 74 young male athletes.

It is well known that [blue light](#) reduces the production of the [sleep hormone melatonin](#). The researchers tested the hypothesis that this suppression of melatonin could improve an athlete's endurance during a 12-minute cycling time trial. They randomly divided the participants into three groups and exposed them to either bright light, blue monochromatic light or control light for an hour. This [light exposure](#) was immediately followed by the [performance](#) test on the bicycle ergometer.

Bright light is less effective

Exposure to blue light significantly improved the athletes' ability to increase their performance during the final spurt of the time trial. This increase was defined as the ratio of the performance measured in the first minute to that of the last minute of the test. The subjects' improved performance in the final spurt also correlated with the amount of blue light. This light was able to effectively suppress the melatonin and thus influence the athletes' sleep-wake cycle.

Compared to the control light, [bright light](#) led to a small increase in overall performance, but the difference was not significant. "Since even minor differences are relevant in top-level sport, however, this should be investigated more closely in further studies," commented Professor Schmidt-Trucksäss.

More information: Raphael Knaier et al, Prime Time Light Exposures Do Not Seem to Improve Maximal Physical Performance in Male Elite Athletes, but Enhance End-Spurt Performance, *Frontiers in Physiology* (2017). DOI: [10.3389/fphys.2017.00264](https://doi.org/10.3389/fphys.2017.00264)

Provided by University of Basel

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