

# Circadian system, misalignment have distinct impact on insulin

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(HealthDay)—The endogenous circadian system, behavioral cycle, and

circadian misalignment have distinct effects on insulin sensitivity and  $\beta$ -cell function, according to a study published online June 4 in *Diabetes, Obesity and Metabolism*.

Noting that shift workers, who experience circadian misalignment, have an increased risk of type 2 diabetes, Jingyi Qian, Ph.D., from Brigham and Women's Hospital in Boston, and colleagues examined the separate and relative impacts of the circadian system, behavioral/environmental cycles, and their interaction (circadian misalignment) on insulin sensitivity and  $\beta$ -cell function. The major determinants of [glucose control](#) were quantitatively assessed in 14 healthy adults using a randomized, crossover design with two eight-day laboratory protocols that involved three baseline inpatient days with habitual sleep/wake cycles followed by four inpatient days with the same nocturnal bedtime or with 12-hour inverted behavioral/environmental cycles.

The researchers found that circadian phase and circadian misalignment impact [glucose](#) tolerance through different mechanisms. The circadian system mainly decreases both dynamic and static  $\beta$ -cell responsivity to reduce glucose tolerance in the biological evening versus the biological morning. In contrast, circadian misalignment did not affect  $\beta$ -cell function but reduced glucose tolerance mainly by lowering insulin sensitivity.

"The results show separate effects of the endogenous circadian system, the behavioral [cycle](#), and [circadian misalignment](#) on [insulin sensitivity](#) and  $\beta$ -cell responsivity with relevance for daily glucose regulation in diurnally active people as well as night-shift workers," the authors write.

Two authors disclosed financial ties to the pharmaceutical and nutrition industries.

**More information:** [Abstract/Full Text](#)

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