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Dietary control of circadian rhythm studies

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Keywords

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Abstract

Circadian rhythm is the natural internal 24-hour clock that is affected by light and the external environment, and it controls our wake and sleep cycle. Clinical research studies study the circadian rhythm and the effects of other factors, such as hypertension and obesity, on the circadian rhythm. The OHSU Clinical and Translational Research Center (CTRC) includes three inpatient beds set up for complete temporal isolation, light control, and restricted room entry. There are currently numerous inpatient circadian rhythm studies taking place, each of which has its own methodology. Because of the rigorous control needed to study circadian rhythm, an equally rigorous standardized diet is essential. However, there is limited published knowledge regarding dietary control for circadian studies. Because of this, we wanted to examine the dietary methodology used in circadian rhythm protocols taking place on the CTRC. CTRC circadian rhythm studies protocols from the past five years were examined, and CTRC bionutritionists were consulted, to understand methodologies and challenges in providing strictly controlled diets. We found that these meals were tailored to participant's energy needs and provided precise nutrient content. In addition, these meals were free from time cues, neutral in temperature to avoid alteration to body temperature, and free of caffeine. Challenges included research participant dietary restrictions/preferences and satisfaction with diets. The results from this review can be applied to dietary design of future studies that examine the interplay between sleep, metabolism, nutrition, and obesity.