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## Uncalibrated Chronotypes: Circadian Clocks in the Wake of COVID-19

Nicolas Nelson

*Thomas Jefferson University, nicolas.nelson@students.jefferson.edu*

Zachary Highley-Gergel

*Thomas Jefferson University, zachary.highley-gergel@students.jefferson.edu*

Nicole Simone

*Thomas Jefferson University, Nicole.Simone@jefferson.edu*

Nikolaos Mouchtouris

*Thomas Jefferson University, nikolaos.mouchtouris@jefferson.edu*

Adam Dicker

*Thomas Jefferson University, adam.dicker@jefferson.edu*

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Nicolas Nelson

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### **UNCALIBRATED CHRONOTYPES: CIRCADIAN RHYTHMS IN THE WAKE OF COVID-19**

Nicolas Nelson, Zachary Highley–Gergel\*\*, Nicole Simone, Nikolaos Mouchtouris\*, Adam Dicker

**Background:** All life is attuned to Earth’s light–dark cycle. In humans, the hypothalamus calibrates the body to circadian cycles of homeostatic activity. The mechanism responsible may run shorter or longer than 24 hours, which is thought to be the basis of chronotype—an intrinsic preference for mornings or evenings. Circadian rhythms can be recalibrated by environmental cues (lighting, temperature, mealtimes) to keep the body aligned with societal time; however, chronic disruptions produce a range of adverse cognitive effects. Early COVID-19 stay-at-home conditions were unique for students because their cues no longer adhered to strict scheduling. Our objective was to determine how this loss of timing affected medical students’ sleep behaviors. We hypothesized that stay-at-home would unmask chronotype-concordant schedules, uncoupling them from societal time. **Methods:** We created a Qualtrics survey modeled on the Munich Chronotype Questionnaire to ask about sleep and related habits. Medical students were recruited from Sidney Kimmel Medical College. Pennsylvania’s stay-at-home order began 3/19; enrollment spanned 5/8–5/18 to ensure students had settled into their routines. Our primary measures were self-reported sleep times, pre-pandemic versus stay-at-home. Other measures included changes in sleep-related habits. Surveys also predicted each respondent’s current chronotype, which they could verify and indicate whether it had changed. Excel and Prism GraphPad were used for analyses. **Results:** We received 123 entries with complete responses from 103, of which 78% reported consistent changes in sleep habits. For the chronotype-predicting portion, we received 66 responses with an accuracy of 93% excluding mispredictions of “no preference.” Of the 50

correctly predicted chronotypes, 28% had changed from before the pandemic. **Discussion:** These outcomes suggest that the unstructured nature of stay-at-home unveiled individual chronotypes in some medical students. Self-governed scheduling in preclinical years might therefore be beneficial for medical students' circadian rhythms, supporting novel paradigms like the flipped classroom.