



**Chronology** is the study of arranging events in order according to when they occurred. Think about using a timeline or a list of events as an example. The "actual temporal sequence of past events" is also determined. A component of periodization is chronology. It also falls within the umbrella of history, which includes the study of the geologic time scale, earth sciences, and earth history.

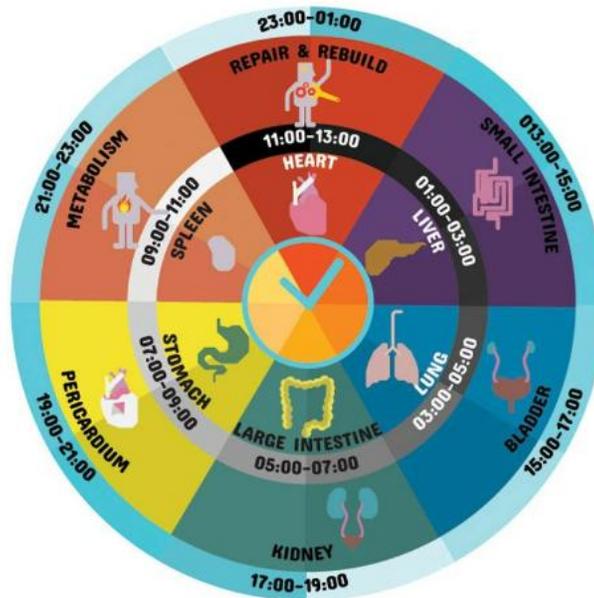
The study of time processes in living things, including periodic (cycle) phenomena like how they adjust to the rhythms of the sun and moon, is called **chronobiology**. Biological rhythms are the term used to describe these cycles. The term "chronobiology" is derived from the Greek words "chronos" (meaning "time") and "bios" (meaning "life"), referring to the study of the science of life. The names chronomics and chronome, which are related, have occasionally been used to characterize the molecular processes underlying chronobiological phenomena or their more quantitative facets, particularly when comparing the cycles of different organisms. [1]

## **Introduction**

Because it is connected to the cyclical nature of biological events and the justification for timing the distribution of medications to maximize patient benefit, chronopharmacology — the approach of taking advantage of what the clock has set in motion in terms of pharmacology — is widely acknowledged. Significant progress has been made in the timing of chemotherapy.

Chronopharmacological research has, for instance, demonstrated the effects of various antidepressants (imipramine, chlorimipramine, clorgyline, etc.) on the rhythm period in animals. As in other fields, the activity and safety of medications used for mental therapy rely on their time of administration. It has also been shown that there is variability related to

the timing of the administration of psychotropic medications, such as benzodiazepines, stimulant antidepressants, and antipsychotics. These temporal fluctuations in the drug's mechanism of action on receptors or in its fate within the body (chronokinetics) can be used to explain these chronopharmacological effects. Chronotherapeutic research on medications like clomipramine, haloperidol, and imipramine, among others, has been conducted as a result of the application of these concepts to the treatment of psychiatric conditions, many of which are linked to a malfunction of the biological clocks.



## Chronopharmacology and Psychiatric Treatment

Circadian disruptions connected to a modern lifestyle may be a significant factor in the frightening rise in mental disease. Mental disorders are often associated with abnormal circadian rhythms. Severe psychiatric symptoms and psychiatric metabolic comorbidities are risk factors for the evening chronotype, which is connected to circadian misalignment. Circadian rhythm resynchronization frequently reduces the symptoms of mental illness. Additionally, research suggests that preventing circadian misalignment may lessen the chance of developing mental illnesses and the adverse effects of neuro-immuno-metabolic disturbances in psychiatry. The timing of meals, which controls the host's circadian rhythms, is a significant factor in the gut microbiota's diurnal rhythmicity. Through the manipulation of the temporal circadian regulation of food, a promising chronotherapeutic approach to the prevention and/or treatment of mental diseases has developed. Through the modification of gut microbiota, temporal circadian regulation of food has become a promising chronotherapeutic approach to prevent and/or aid in the treatment of mental diseases.

A frequent explanation for the recognized rise in mental illness incidence centers on current lifestyle factors, such as poor eating, exercise, and sleep patterns, as well as our "stressogenic" surroundings. The misalignment of circadian rhythms, which are self-sustaining rhythms with a duration of roughly 24 hours, brought on by modern lifestyles, may have a substantial impact in this respect. Notably, it has been suggested that irregular sleep-wake cycles, the consequent chronotype, poor sleep, and circadian rhythm abnormalities significantly contribute to the susceptibility and duration of symptoms of a variety of mental diseases.

## Circadian Rhythms

The temporal rhythm of our rotating globe has influenced the rhythmic behaviours and health responses that living things have evolved over the course of evolution. Living species have developed their own organs to keep track of time, as the way time is organized in the universe is strategically essential for life. Internal clocks in these organs regulate activities and reactions, displaying circadian patterns.

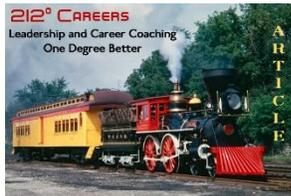
The interaction of genetic and environmental variables controls circadian rhythms. Lifestyle factors are significant predictors of human circadian health, alongside ecological influences. Endogenous molecular clocks synchronize or align critical internal behavioral and physiological processes at advantageous times of day, based on cues from the environment or zeitgebers, thereby accurately governing them.

The suprachiasmatic nucleus (SCN) of the hypothalamus serves as a "central clock" or circadian pacemaker, interacting with the environmental cycle of light and darkness to coordinate "peripheral clocks" through various hormonal and neuronal signals, thereby maintaining the rhythmic expression of oscillating genes [9]. Specifically, circadian oscillations from the SCN regulate approximately 5–10% of the genes in peripheral tissues, controlling several critical physiological processes, including immune response, homeostasis, and metabolism. Thus, circadian rhythms are present in body temperature, heart rate, digestion, attention span, mood, cognition, and behavior, connecting biological functions to the environment.

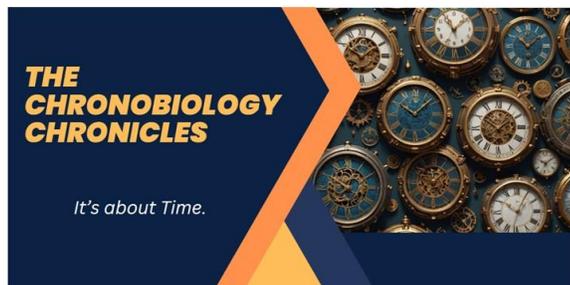


## Conclusion

Individuals with a variety of psychiatric diseases, such as MDD, bipolar disorder, anxiety, ADHD, and SCZ, frequently report having altered circadian rhythms. The specific nature of the link between circadian rhythm disturbance and psychopathology in the context of each mental disorder is, however, poorly known because the majority of clinical data reported to date are correlational. Circadian rhythms can be compromised by disease severity, which is well-documented to increase with circadian disturbance. Studies on rodents have shown that induced circadian disruption can cause affective alterations, suggesting that while circadian disruption may not be the only factor contributing to mood disorders, it may trigger or aggravate symptoms in people who are predisposed to developing mental health problems.



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