



Total sleep time (TST)

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What is TST? Why is it a core measure?

Total sleep time is the duration of time (hours, minutes, and/or seconds) spent sleeping in the primary sleep period. Total sleep time (TST) is a **core measure** because it is an important indicator of health and mortality. Adequate TST is crucial for maintaining physical and mental well-being, as insufficient sleep duration has been linked to increased all-cause mortality and increased risk for various health issues, such as obesity, cardiovascular disease, impaired immune function, and cognitive deficits.

TST is a key parameter in diagnosing sleep disorders such as insomnia, sleep apnea, and hypersomnia. Researchers use objective methods such as polysomnography (PSG) and actigraphy, along with subjective measures like sleep diaries, to assess TST. Understanding TST helps researchers and clinicians evaluate sleep quality and develop interventions to improve sleep health. Beyond primary sleep disorders, the **relationship between TST and underlying medical conditions** is two-sided: sleep can be affected by many conditions such as pain, shortness of breath, autonomic nervous system disorders, hormonal imbalance, autoimmune and metabolic disorders, and environmental factors such as work schedule or habitat, and inadequate sleep time can exacerbate existing medical conditions. As a general health indicator, **measuring** TST and **comparing** it with the healthy range can reveal a systematically accumulated sleep debt or oversleeping.



Why does TST matter to researchers?

Monitoring and assessing treatment efficacy:

Measuring TST provides essential baseline data to understand individuals' sleep patterns and identify deviations from healthy sleep norms. By monitoring TST before, during, and after treatment interventions, researchers can assess the effectiveness of therapeutic approaches in improving sleep duration and quality. Assessing TST allows researchers to investigate the long-term effects of interventions on sleep maintenance and to identify potential adverse effects or treatment-related changes in sleep patterns, ultimately informing evidence-based practices for managing sleep disorders and promoting sleep health. TST can also help in determining inclusion or exclusion criteria for relevant studies.

Determining impact on sleep within other disorders:

Many disorders have sleep impacts that affect patient health and occur outside the context of traditional sleep disorders. Infectious illnesses (e.g., flu, COVID-19), traumatic brain injuries, respiratory disorders, mental health conditions, neurological disorders, and many other diseases and conditions can have sleep-related symptoms. Understanding a patient's total sleep time can be helpful to understanding non-primary sleep disorders better and influencing therapeutic research pathways.



Why does TST matter to clinicians?

Diagnosis: TST is essential for diagnosing various sleep disorders such as insomnia, sleep apnea, and circadian rhythm disorders. Changes in TST may also signal underlying medical or psychiatric comorbidities. For example, persistent insomnia despite treatment may prompt clinicians to evaluate for comorbid conditions such as depression or anxiety, which could be contributing to sleep disturbances.

Clinical management: TST serves as a vital indicator of sleep health and can guide treatment decisions effectively, helping clinicians tailor treatment plans for patients with sleep disturbances. For example, if a patient reports consistently short TST, interventions aimed at improving sleep duration, such as sleep hygiene education or cognitive-behavioral therapy for insomnia (CBT-I), may be recommended. Similarly, in sleep disorders like sleep apnea, interventions such as continuous positive airway pressure (CPAP) therapy aim to enhance TST by reducing nighttime awakenings and improving respiratory function during sleep. After initiating treatment, clinicians can monitor changes in TST over time to assess treatment efficacy and make necessary adjustments.