

# DELAYED SLEEP PHASE SYNDROME



## **Delayed Sleep Phase Syndrome (DSPS)**

*Everyone differs in their need for sleep, but once we have adapted to a particular sleeping pattern, most of us are able to keep to a schedule. People who suffer from Delayed Sleep Phase Syndrome are unable to get their sleep pattern in line with what is considered normal, or even if they do, they are not able to maintain a normal pattern.*

**What is Delayed Sleep Phase Syndrome?** Delayed Sleep Phase Syndrome (DSPS) is believed to be a disorder of the body's timing system - the biological clock. The biological clock of people with DSPS is set to have them naturally fall asleep and wake up later than what is considered normal. This means that they are unable to fall asleep until very late at night. Sometimes they may not fall asleep until the early hours of the morning. They then do not wake up until late morning or the afternoon. In Australian terms, it's like having your body in Sydney but the body clock in the brain is located in Perth. This inability to fall asleep at a more typical bedtime can be mistaken for a typical case of insomnia. The difference is if people with DSPS are allowed to follow their natural biological clock, they usually have no problem either falling asleep or waking up naturally.

**What is the circadian rhythm and what is normal?** Each person has a central biological clock located in their brain and each cell in the body has its own mini-biological clock (peripheral clocks). Each day the body's biological clock goes through a cycle where various chemicals or hormones are produced to control and synchronise body functions. These cycles are called circadian rhythms. For example, sleep has a circadian cycle where typically there is an alerting signal produced by the biological clock that falls in the evening and we get sleepy. There is also a small reduction in the circadian alerting signal mid afternoon, making napping easier. Some societies take advantage of this as a siesta period. Circadian rhythms are primarily influenced by light and dark exposure but also a range of secondary cues such as meals, alarms etc. Amongst people with normal circadian rhythms, there are some "morning people" who prefer to wake early and go to bed early, and there are "evening people" who prefer to wake later and stay up at night. These differences may be biologically driven but people can still sleep at usual times. People with DSPS cannot do that because they have altered circadian rhythms preventing sleep onset at the usual time.

## **What are the symptoms of DSPS?**

- Inability to fall asleep at a typical bedtime. People with DSPS naturally fall asleep much later than is considered normal.
- Inability to wake up at a typical morning time. Because of the delay in falling asleep people with DSPS find it extremely difficult to wake up in the morning.
- Excessive daytime sleepiness if they do get up at a typical morning time. Due to the late sleep onset and yet still needing to get up at the required time for work or school, people with DSPS often experience excessive daytime sleepiness as a result of not getting enough sleep.

Despite feeling tired for most of the day people with DSPS will again have trouble falling asleep until late at night. This cycle of forced awakening with excessive daytime sleepiness yet delayed sleep onset and can go on indefinitely causing sufferers to experience extreme sleep deprivation if they are obliged to have a normal schedule. However, when allowed to sleep longer, for example, at the weekend, they may sleep until the afternoon and wake refreshed. DSPS doesn't bother everyone who has it. Some people find ways to adjust their lifestyle to accommodate their late sleep schedule.

**Is DSPS like Jet-Lag?** In jet lag the "sleep phase" becomes shifted because the body's biological clock retains the rhythm that it was used to in the home country. If you travel to the other side of the world this means that your body expects to be asleep when you need to be awake and vice versa. Jet lag lasts only a few days at most and is generally overcome by forcing yourself to sleep at the time expected in the new country. Traveling eastwards, even from Perth to Sydney, may make it difficult to fall asleep for a few nights but this usually resolves quickly.

**Who suffers from DSPS?** Adolescents have biologically different sleep and wake patterns compared to the preadolescent or adult population which makes them particularly susceptible to experiencing DSPS-like syndromes. It is estimated to affect about 7% of adolescents however it can occur at any age. While some teenagers will grow out of it for some it can plague them their whole life.

**What causes DSPS?** The exact cause of DSPS is not completely known. It is thought that it may be caused by an inability to reset the sleep/wake cycle in response to the environmental time cues - perhaps the biological clocks of DSPS sufferers have an unusually long cycle, or perhaps they are not sensitive enough to time cues. There may be an imbalance in some of the hormones that help to maintain this sleep/wake cycle, particularly melatonin, which may be used to treat the disorder.

**How is DSPS diagnosed?** DSPS is a sleeping pattern and there is no simple diagnostic test that will show whether the person has DSPS. Referral to a sleep specialist is usually necessary. The sleep specialist may ask detailed questions about sleep pattern and ask the person to keep a sleep diary for a couple of weeks. This involves a daily recording of:-

- The time they tried to fall asleep
- The time they think they fell asleep
- Any night-time awakenings
- The time they woke up
- The time they got out of bed
- The time they had to be up
- Whether they woke up naturally
- Any daytime naps - how long and when
- What medications are used

**How is DSPS treated?** Sleep specialists generally treat DSPD by prescribing bright light in the morning, restricting light exposure in the evening, and/or prescribing immediate release melatonin in the evening, in an attempt to manipulate the body's circadian rhythm to establish an acceptable sleeping pattern. This may be effective for some people but is not for others. For some people DSPS may eventually get better by itself.

**What is Chronotherapy?** This involves going to bed later and later each day (and waking later and later each morning) until the desired sleep time is reached. This may work for some people but others find they struggle with the new schedule while others eventually revert back to their body's preferred schedule. There is also the risk that this treatment may cause the DSPS to progress into non-24-hour sleep-wake disorder, which is a lot more difficult to live with. Chronotherapy is best done under supervision in a clinical setting.

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**Are there things that can be done to lessen the impact of DSPS?** For many people with DSPS sleeping on a normal schedule may be difficult or even impossible and trying to do so can cause sleep deprivation and stress. In these cases, making lifestyle adjustments that allow them to live according to their natural sleep schedule may be the only answer. This may include working in the evening or night shift or working flexible hours from home. Some people find sleeping in two split shifts helpful eg: taking four hours of sleep in the day and four at night. Significant modifications to sleep patterns should only be done under the supervision of a sleep specialist and if daytime sleepiness is a problem, driving or operating dangerous machinery should be avoided.

**DISCLAIMER - Information provided in this fact sheet is general in content and should not be seen as a substitute for professional medical advice. Concerns over sleep or other medical conditions should be discussed with your family doctor.**