

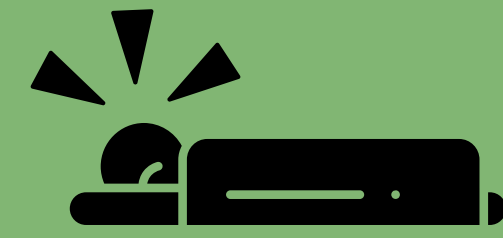
# SLEEP DEBT

## TOO LITTLE SLEEP: WHAT IT DOES TO YOUR BRAIN AND BODY

### WHAT IS SLEEP DEPRIVATION?

A very common issue, when you get no sleep or a less-than-optimal amount of sleep. There are two types:

**Partial**  
where sleep is reduced or interrupted



**Total**  
where no sleep occurs



### CAN LEAD TO SLEEP DEBT

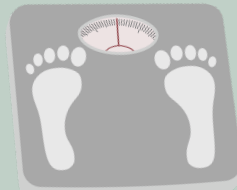
Unless the sleep we lose is repaid at a later point, the more sleep lost → the more sleep debt we accumulate.



Fatigue can slow responses, impair judgement and communication, which increases risks in safety-critical settings (e.g., healthcare and driving)



Worse mood  
Greater irritability  
Poorer memory and decision making



Higher BMI and risk of obesity due to changes in appetite, hormones + increased intake / reduced expenditure

### EFFECTS



Impaired glucose handling + stress-hormone changes  
Higher insulin resistance after repeated restricted sleep



Linked with a higher risk of mental disorders e.g. depression and anxiety

### WHY DOES IT HAPPEN

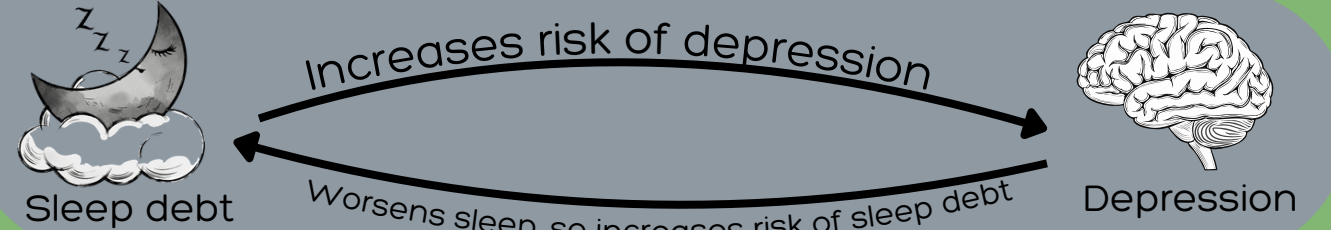
- > High stress
- > Shift work
- > Study schedules
- > Poor physical/mental health
- > Caregiving duties
- > More likely in those under 40

### RISK OF DEPRESSION

Sleep deprivation increases the risk of depression. However this is more commonly caused by chronic and cumulative sleep debt rather than acute sleep deprivation.



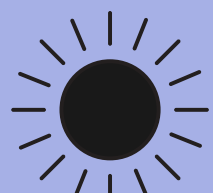
There is a complicated relationship:



### SLEEP HYGIENE TOOLKIT: Simple steps to avoid sleep debt



Stick to a consistent sleep and wake time every day



Get plenty of light in the morning and limit light at night



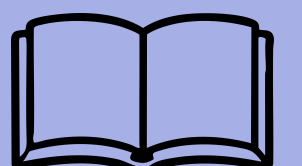
Stop drinking caffeine 9 hours before bed



Limit alcohol intake



Avoid using sleep medications/ melatonin unless medically advised



Utilise calming pre-sleep activities e.g. reading or listening to music

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# WHY OVERSLEEPING DOESN'T 'PAY OFF' ACCUMULATED SLEEP DEBT

# SLEEP

## OVER-EXTENSION

### DEFINITION OF OVERSLEEPING

Sleeping more than 9 hours in a single stretch.

**Weekend catch-up sleep (WCUS)** beyond 2 hours also counts.

Oversleeping can reduce restorative aspects of sleep, and it is associated with poorer health, including a greater risk of developing depression.

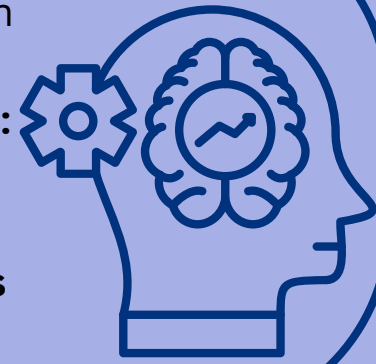


### WHAT ARE THE RISKS?

Meta analyses and systematic reviews show long sleep duration is associated with:

#### NEUROCOGNITIVE CONDITIONS

Long-sleep associated with increased risk of worse **Neurocognitive outcomes:** greater risk of cognitive disorders such as **dementia** and **Alzheimer's** and **mild cognitive impairment.**



#### MORTALITY

Long sleep duration has around **34% higher risk** and association with **all-cause mortality** than normal. This risk is greater in **women**, for whom long and irregular sleep patterns carry greater mortality risks.



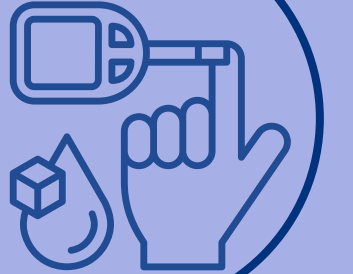
#### CIRCADIAN MISALIGNMENT

Excessive WCUS is associated with **circadian misalignment**, which is the mismatch between your internal body clock and environmental sleep cues. This can affect diet, mood and general health.



#### CARDIOMETABOLIC/STROKE

Long sleep presents a greater risk of: **stroke, coronary heart disease mortality** and **type 2 diabetes.**

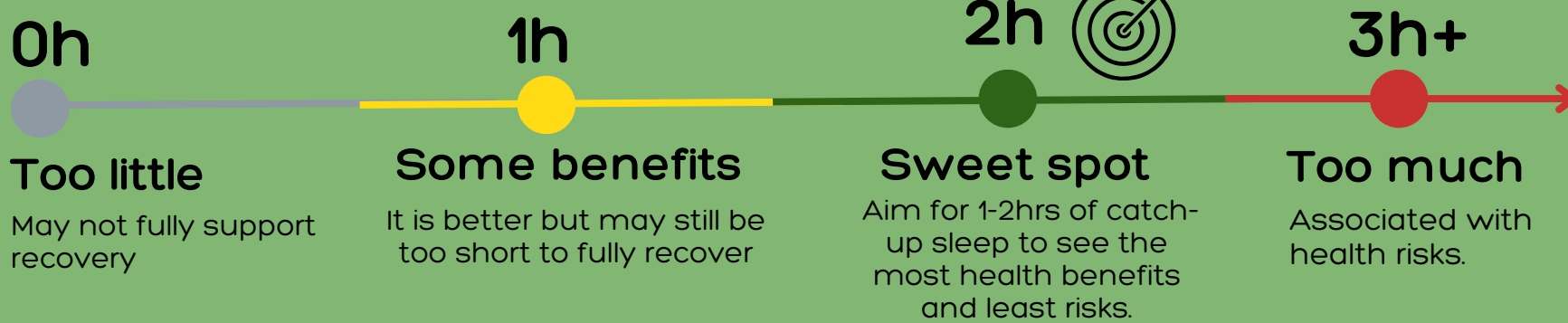


### WHY DOES IT HAPPEN?

- Pre-existing health conditions
- Poor mental health e.g. symptom of depression
- Poor physical health, e.g. chronic pain or frailty
- Lack of sleep during the work week



### HOW MUCH EXTRA SLEEP IS BEST?



Leproult et al. highlighted that after **chronic sleep deprivation**, three nights of over 10hrs in bed partially restored metabolic function.

Recovery varies...

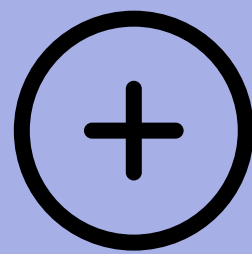
...depending on the person and whether the sleep loss was **acute vs chronic.**



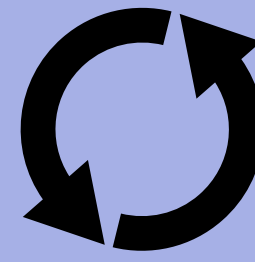
Struggling with sleeping too much can be a sign of underlying health issues, so seek out professional help if it persists!

### HEALTHY SLEEP CATCH UP CHECKLIST:

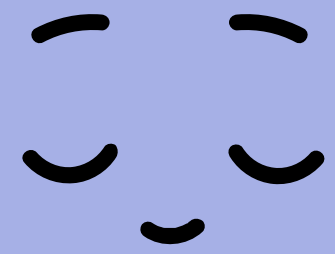
Simple steps to catch up on sleep



Recover sleep gradually by adding only 1-2 extra hours



Maintain good sleep hygiene by keeping a consistent routine



Create a calm sleep environment

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