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Driving and the brain.

Driving for work is a critical workplace risk

Source: WorkSafe New Zealand, *An Overview of Work-Related Harm and Risk in Aotearoa New Zealand*, June 2024.
Mackie Research and AA Research Foundation, Contextual Factors in Driving for Work Crashes (2022).

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What we know impacts drivers

6,098 **Guardian** units in New Zealand

74 Verified **fatigue** events per day

228 **Distraction** events per day

42 **Cell phone** events per day



Source : AutoSense New Zealand Guardian Insights Report 2025–26. Data for the year ended 31 March 2026.

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The Brain

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1. The brain, parts of the brain and what they do

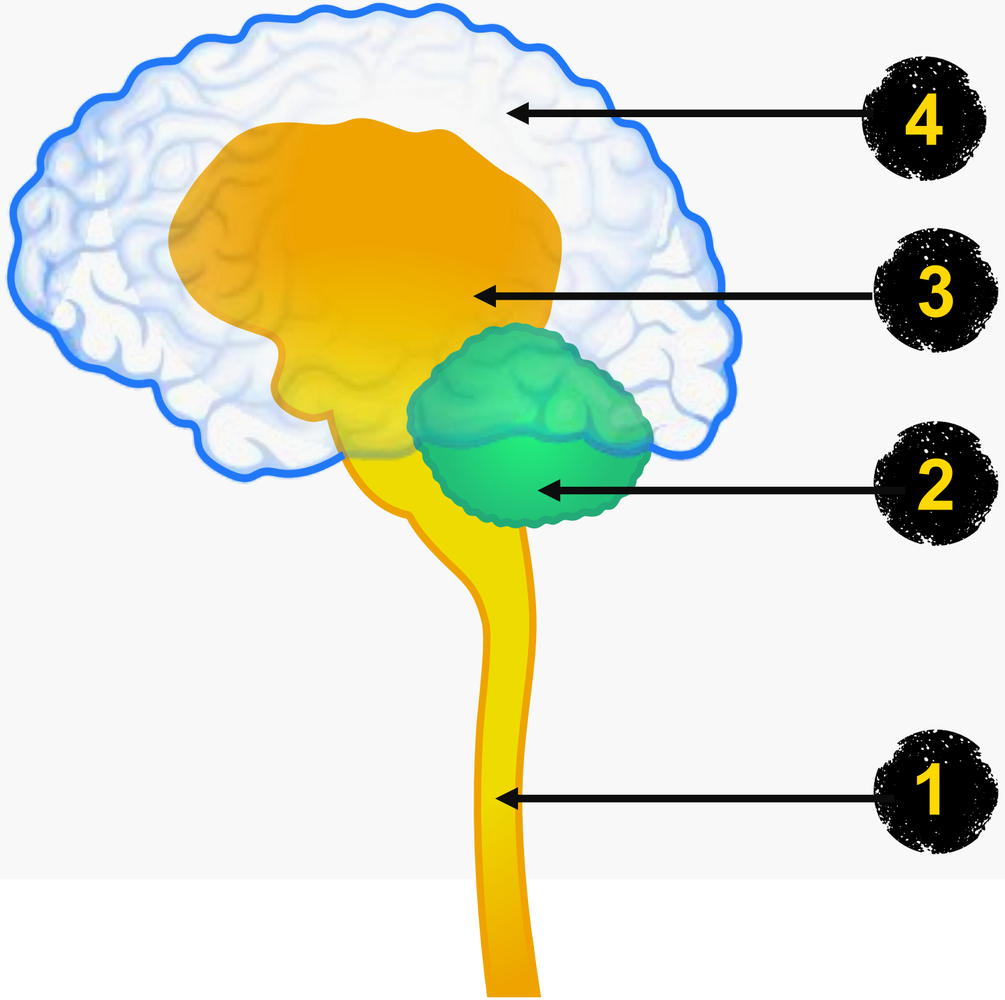
2. How it works when driving

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The green brain is the movement brain.

The front half of the blue brain is for executive decisions.
You need both to drive!



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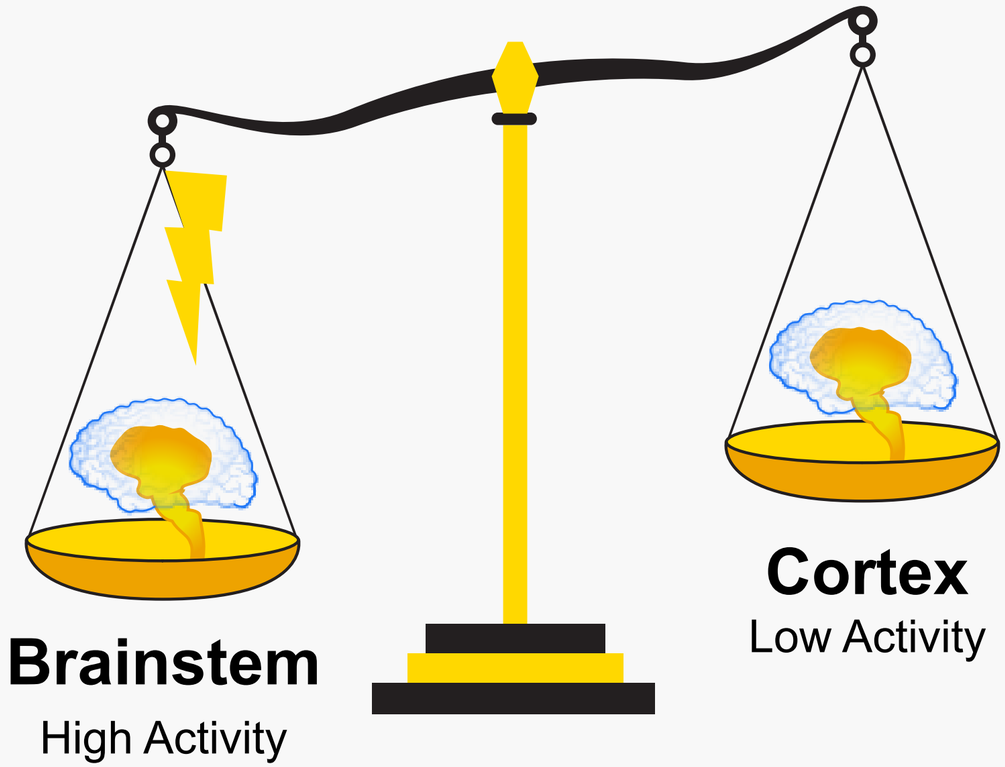
Stress

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As one side increases, the other declines, and vice versa

To really be using your cortex, your brainstem needs to be calm, but the brainstem is in charge



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Fatigue and the brain

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Distraction

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Battery Centre
CH3
05/01/2016

Sleep and fatigue

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Did you arrive ALERT?

FATIGUE

Fatigue describes the feelings of tiredness, sleepiness, reduced energy and increased effort needed to perform tasks at a desired level

No energy in your brain or body
This will affect your ability to carry out your role safely and efficiently, whether in the workplace or while driving.

- Decision making
- Communication
- Reaction time
- Attention
- Productivity
- Mistakes, incidents and injuries

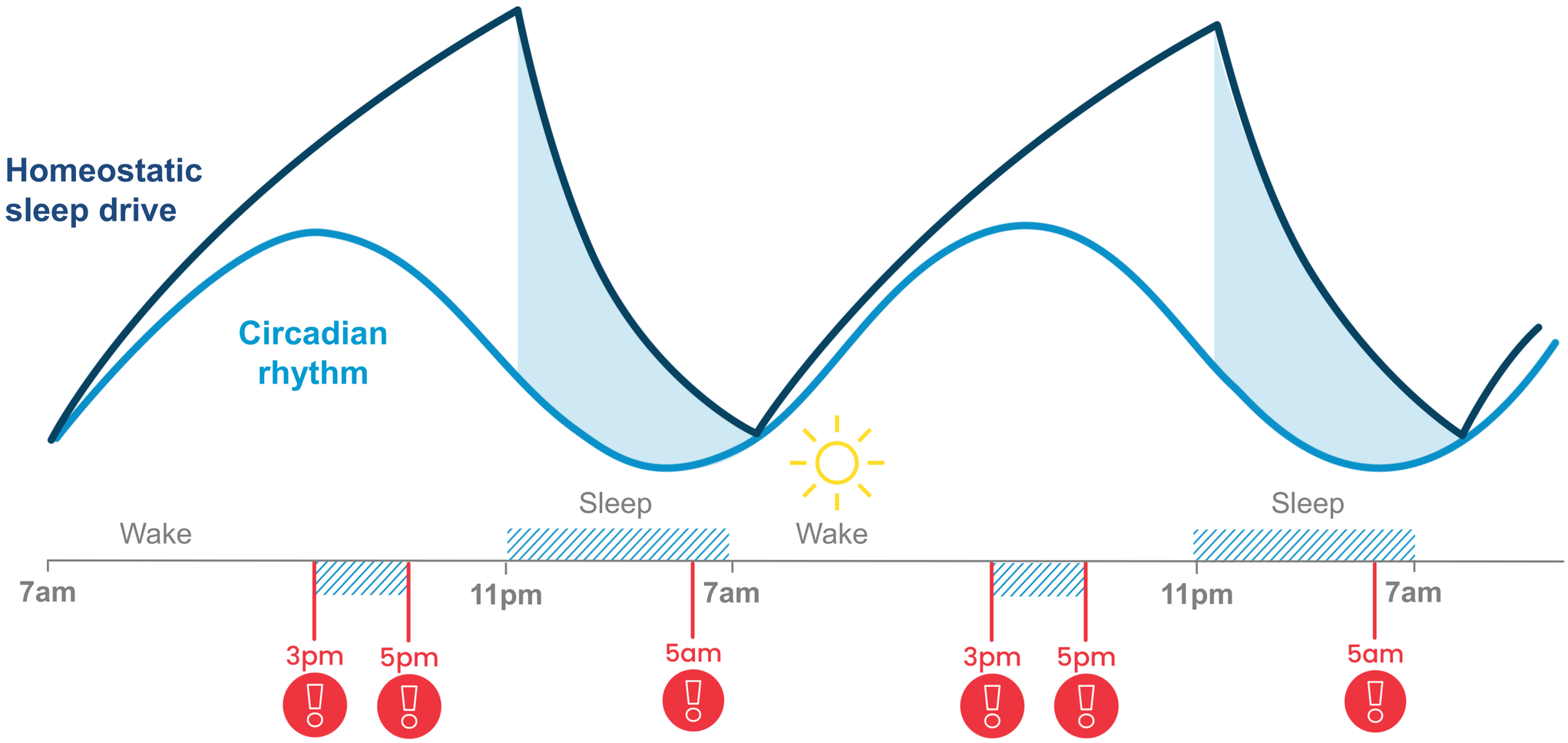
Fatigue is rarely one thing – it’s usually a stack



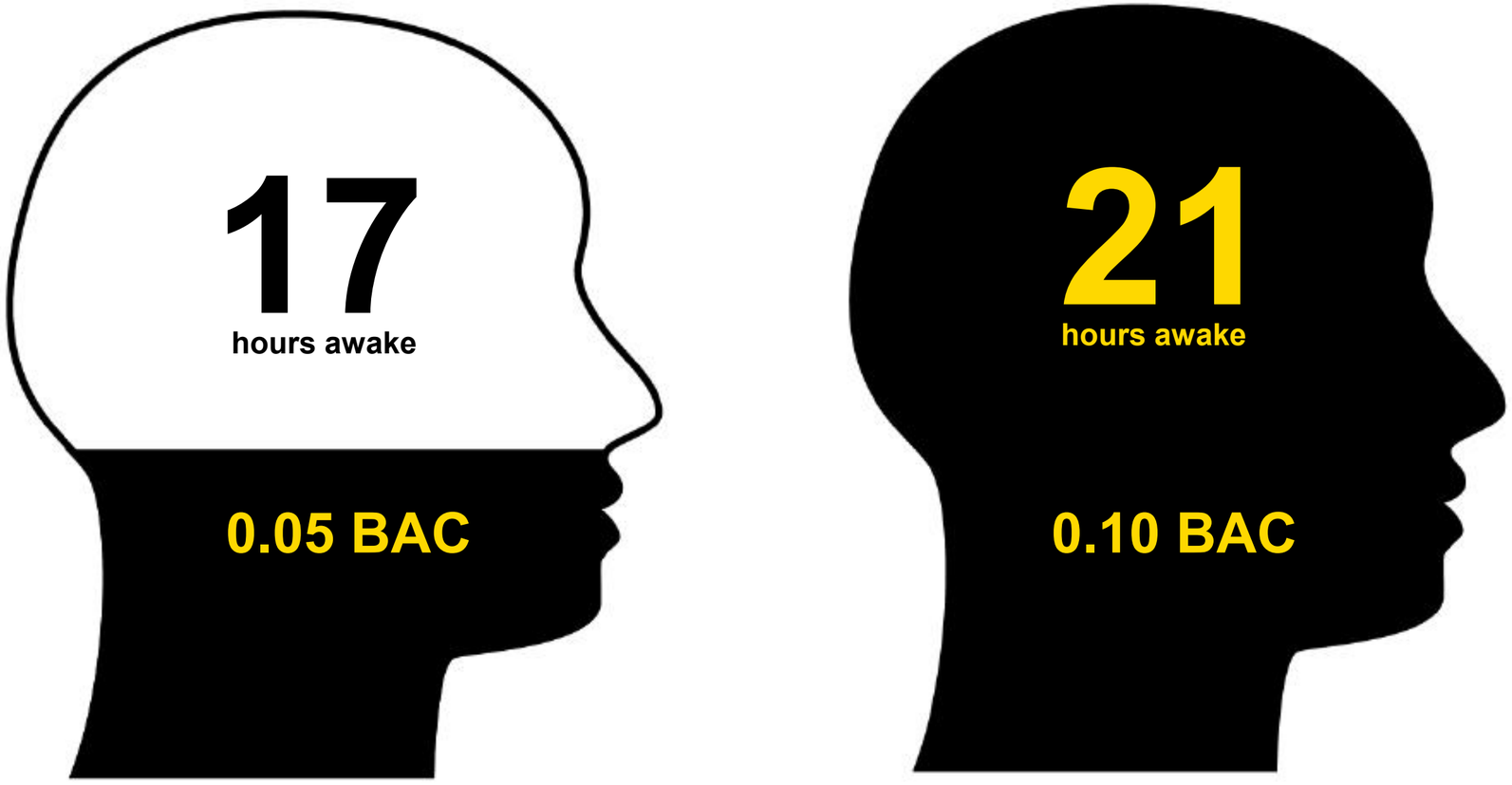
- **Sleep debt**
- **Shiftwork**
- **Long work hours**
- **Time on task**

- Poor diet
- Dehydration
- Sleep disorders
- Lack of exercise
- Mental health disorders
- A combination of work-related and lifestyle factors

Biology of fatigue



Fatigue can impair performance like alcohol



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Signs of fatigue

Daydreaming, wandering thoughts, difficulty remembering the last few kilometers driven

Prolonged blinking, heavy eyelids, difficulty keeping eyes open

Making fewer or larger steering corrections

The speed you drive at creeps up or down

Restlessness, poor concentration, slow reactions

Drowsiness

What actually works when fatigue hits

Short term – manage fatigue

- Caffeine
- 10 – 26 minute nap
- Move your body / take a break
- Light, fresh air, change environment

Long term – manage fatigue

- Sleep (quality and quantity)
- Roster design
- Recovery
- Sleep disorders treatment (sleep apnoea, insomnia, RLS)

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Stages of sleep

N1
(Lightest Sleep)

- Heart rate and breathing slows down
- Muscles begin to relax
- Woken up like you did not sleep at all
- Hypnic jerks

N2
(Light Sleep)

- Heart rate and breathing slows down further
- Body temperature drops
- Brain produces sleep spindles – memory consolidation

N3
(Deep Sleep)

- Sleep Inertia
- Critical for restorative sleep – allowing the body recovery and growth
- Strengthens immune system

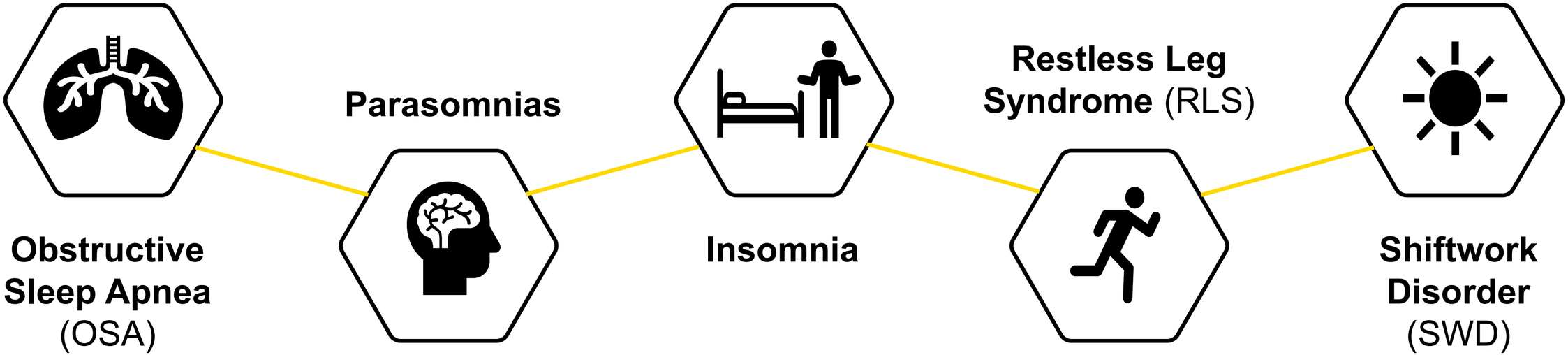
REM
(Dream Sleep)

- Breathing and heart rate picks up
- Provides “emotional first aid”
- Vivid dreams
- Atonia (sleep paralysis)

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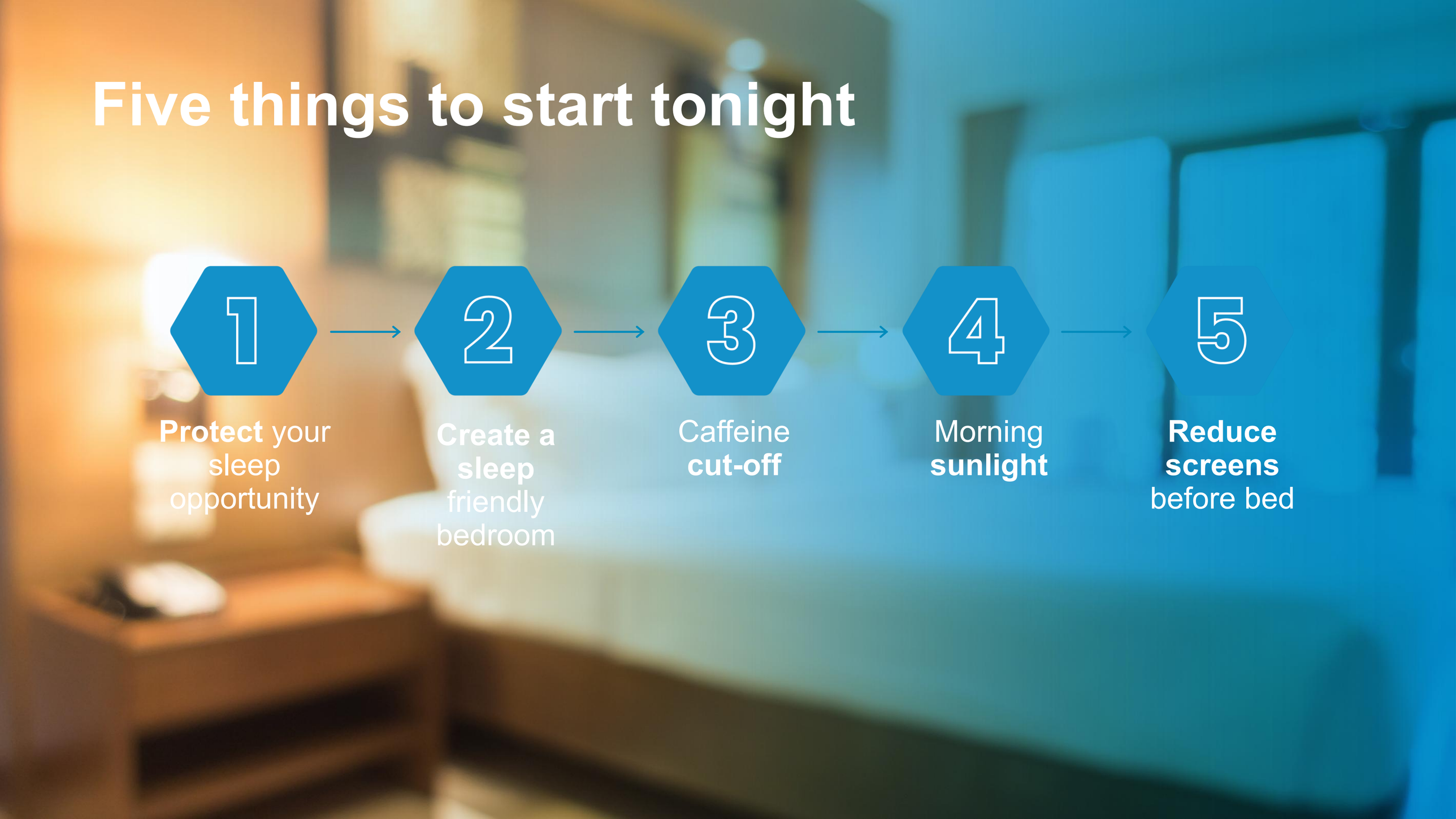
Common sleep disorders



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Five things to start tonight





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Questions

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Thank You

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