

# Sleep - How it supports our health and strategies for sleeping well

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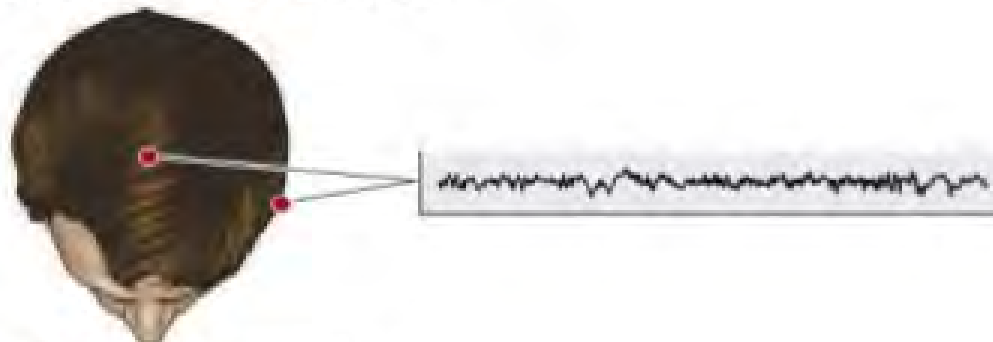
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# Sleep & Health

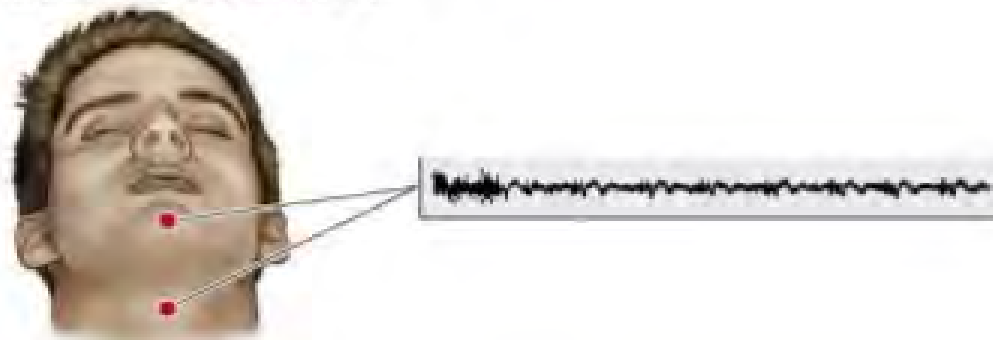
Poor sleep is related to:

- Mental health issues, anxiety, depression
- Cognitive issues – learning & memory, performance, brain fog,
- Metabolic issues – diabetes, obesity, cardiovascular disease, stroke etc..
- Short and long sleep <6 h, >9 h associated with all cause mortality

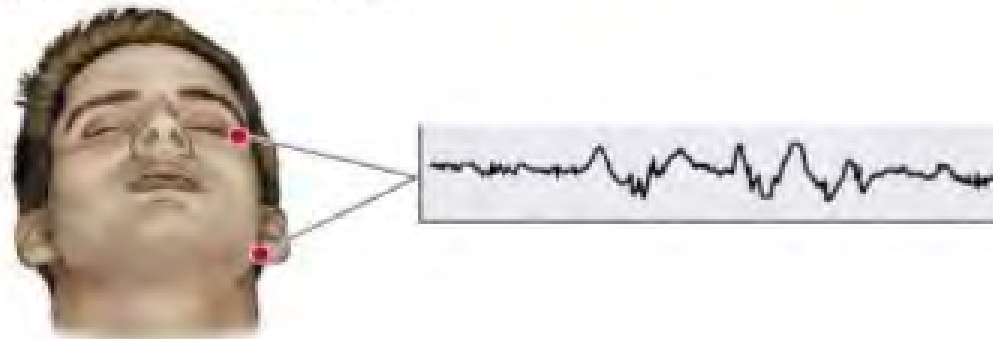
**(A) Electroencephalogram (EEG)**



**(B) Electromyogram (EMG)**



**(C) Electrooculogram (EOG)**



## ► An EEG Recording of the Stages of Sleep

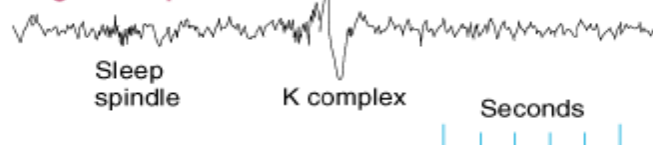
### Awake



### Stage 1 sleep



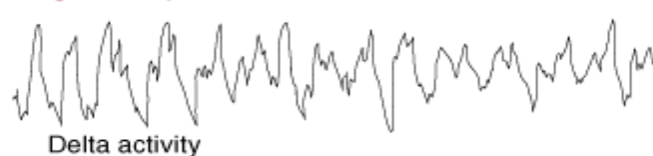
### Stage 2 sleep



### Stage 3 sleep



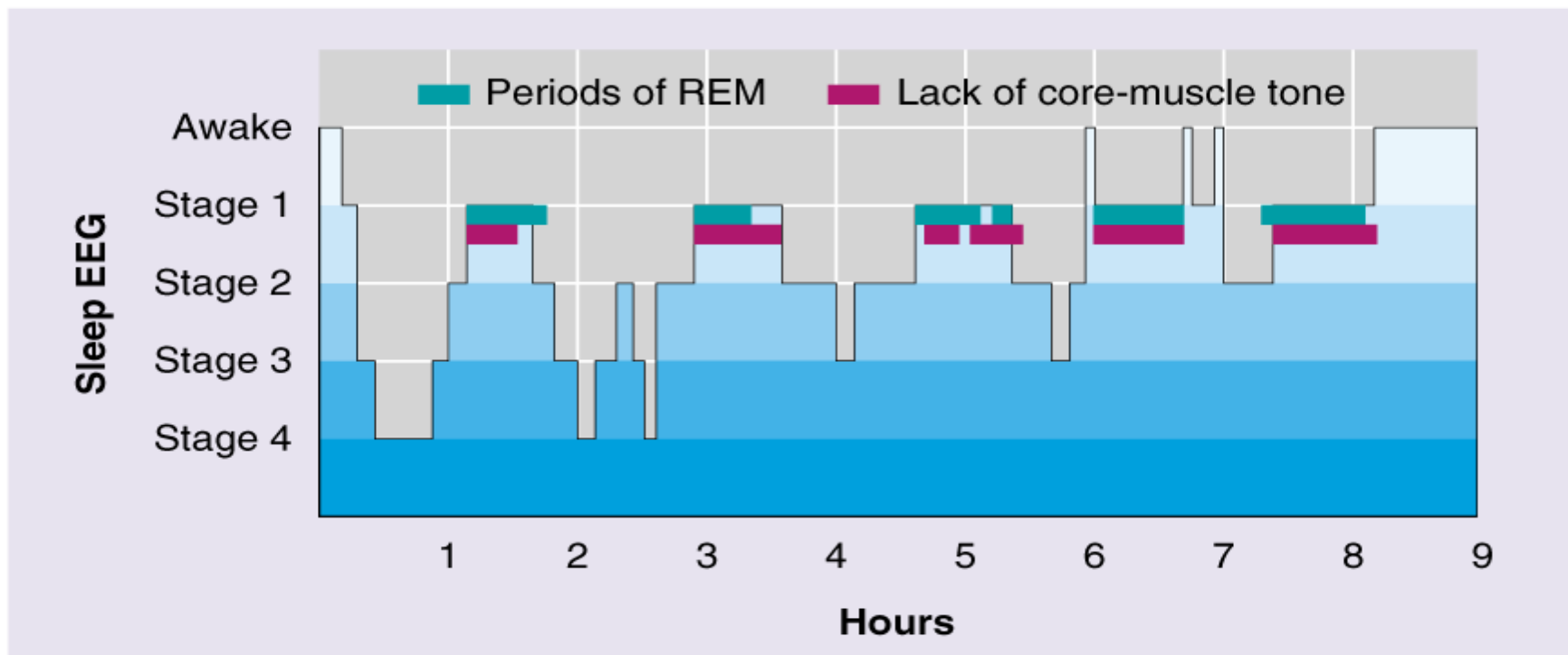
### Stage 4 sleep



### REM sleep



## ► EEG Stages During a Typical Night's Sleep



# NREM and REM Sleep in Cats

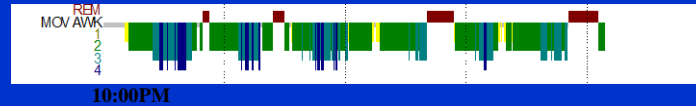
- Can you identify which photo was taken while this cat was in REM Sleep?



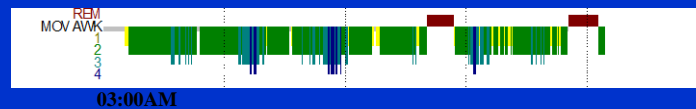


# Sleep hypnograms

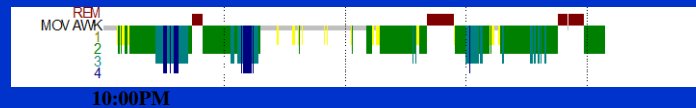
## Normal Sleep Architecture



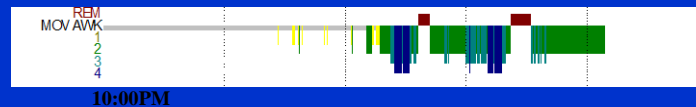
## Delayed Sleep Phase Insomnia



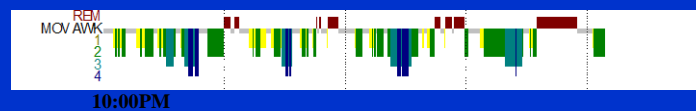
## Maintenance Insomnia



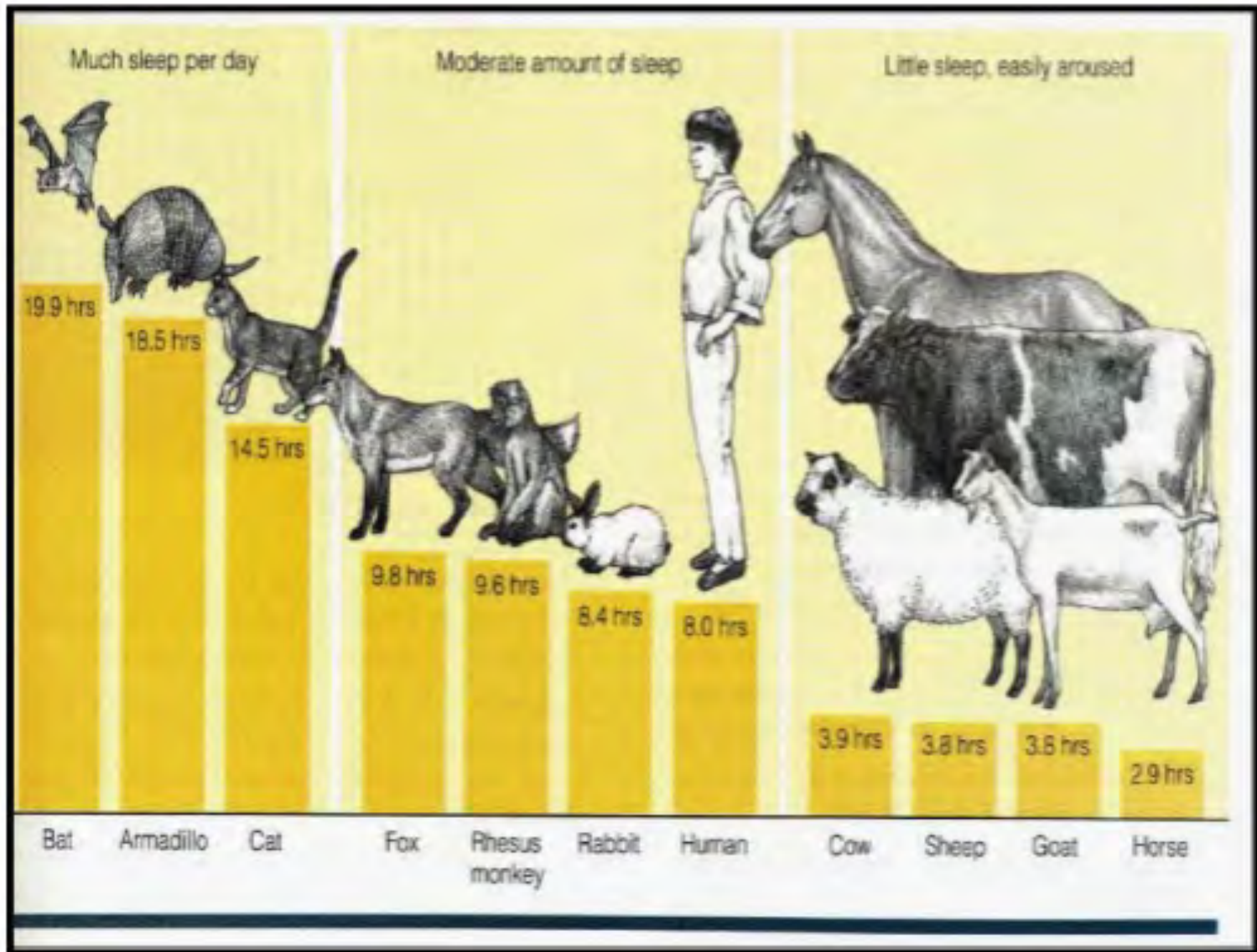
## Initiation Insomnia



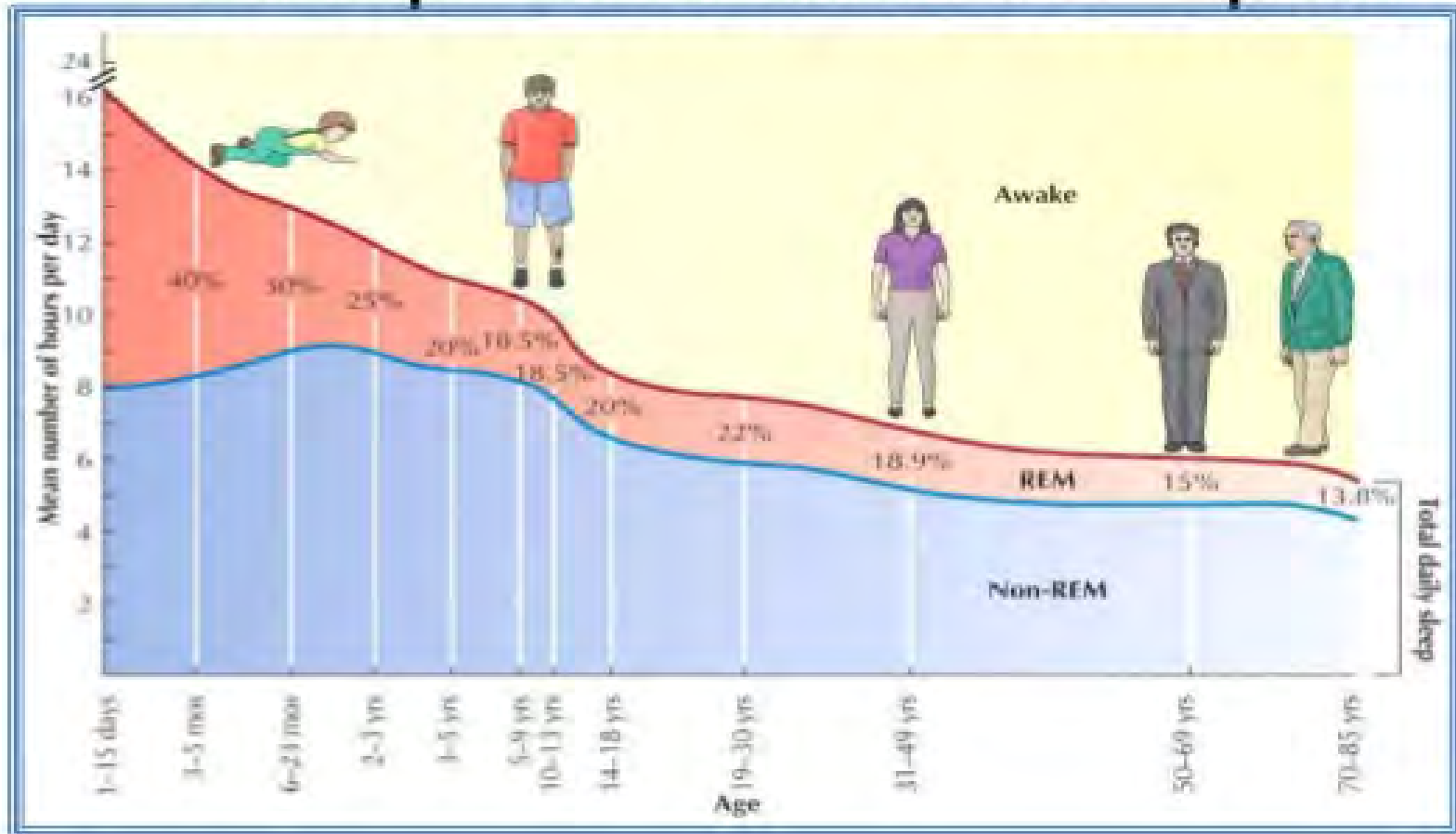
## Sleep Fragmentation





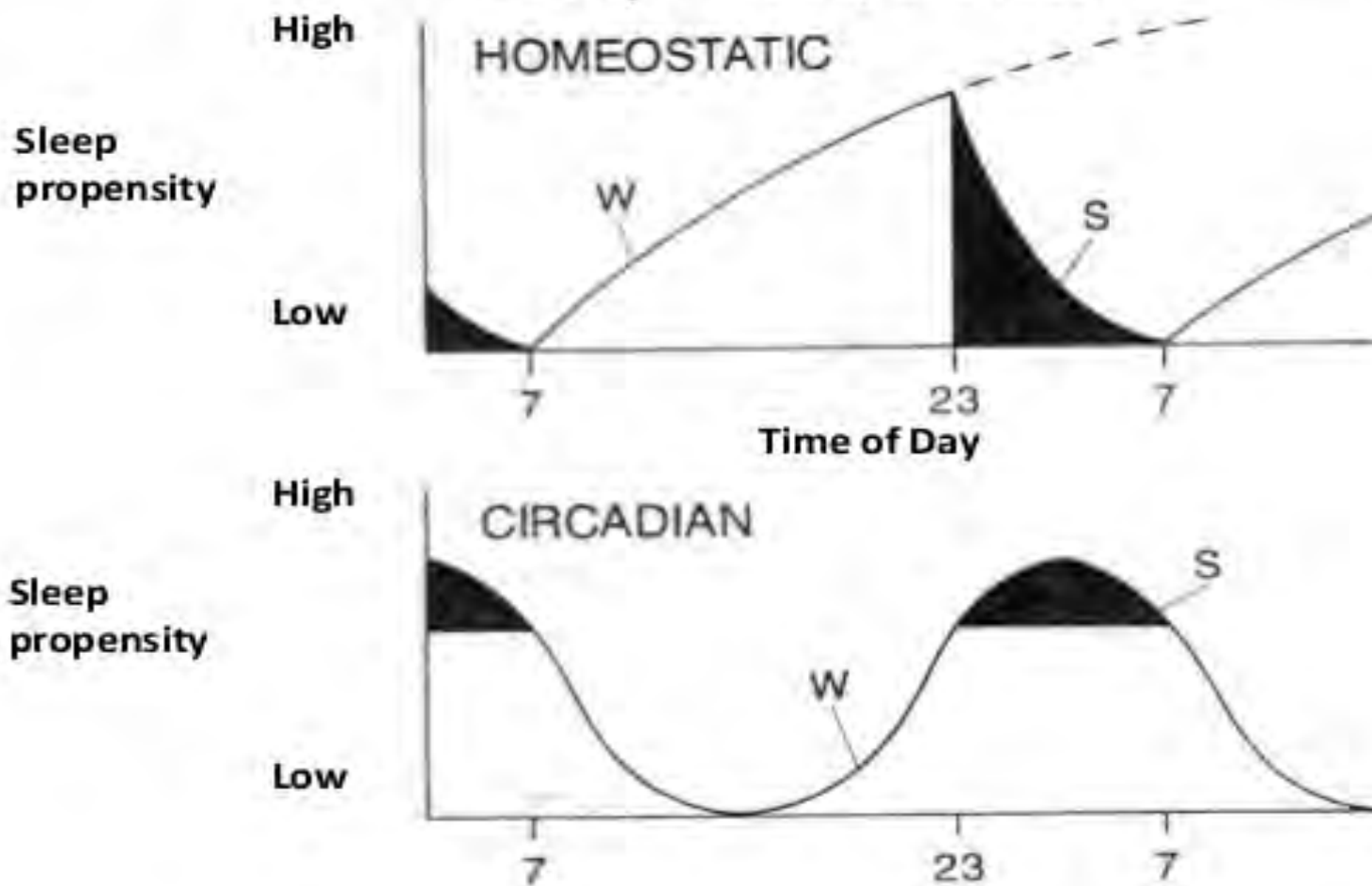


# Sleep Over the Life Span

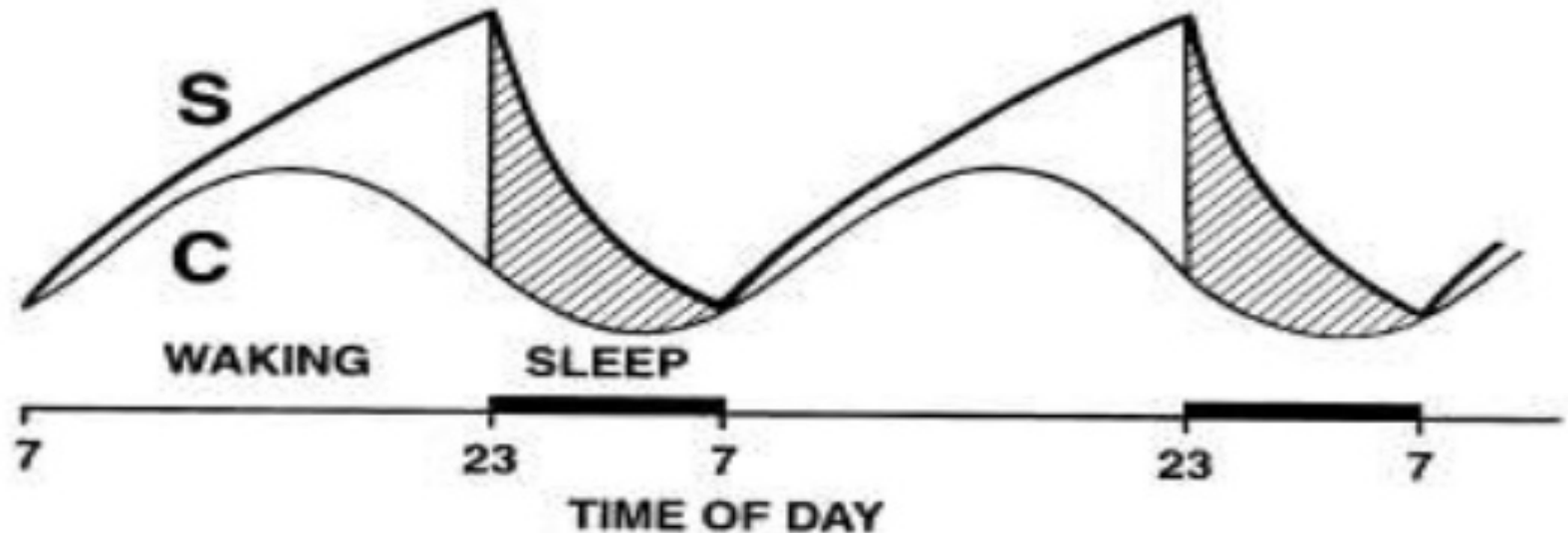


# Homeostatic and circadian regulation of human sleep

Borbely et al., 2001



# Sleep-wake regulation



The bigger the distance between process S and process C, the higher the sleep pressure. So that's the moment when sleep will normally be initiated.

# Sleep Disorders

2 main types:

(1) Dyssomnias - Disorders of initiating or maintaining sleep; and

(2) Parasomnias - disorders of inappropriate arousal during sleep - classified according to sleep stage in which the arousal occurs

# Sleep Disorders

- Insomnia - disorders of initiating and/or maintaining sleep
- Psychophysiological Insomnia
- Idiopathic Insomnia- childhood onset
- Primary or secondary to other conditions

# Sleep Disorders

## Circadian Rhythm Disorders

- Delayed Sleep Phase Disorder
- Period Disorder
- Amplitude Disorder
- Shift-work type
- Jet-lag

# Sleep Disorders

- Apnoea or Apnea - 2 types
- Central
- Obstructive (OSA)
- Symptoms - multiple awakenings, daytime tiredness, fall asleep while passive
- Treatment - continuous positive air pressure (CPAP), weight loss
- SIDs infant apnoea?



# Sleep Disorders

Hypersomnia - too much sleep

- Narcolepsy
- Symptoms - sleep attacks, cataplexy, sleep paralysis
- hypnogogic and/or hypnopompic hallucinations  
- dream like state occurring during sleep paralysis
- Treatment - stimulants, antidepressants

# Primary Insomnia

- Term used to distinguish insomnia considered a distinct entity from insomnia secondary to medical/psychiatric conditions.
- Primary insomnia = Psychophysiologic Insomnia (ICSD-R) = somatised tension & learned associations/behaviours that prevent sleep.

# Secondary Insomnia

- Insomnia secondary to other conditions or factors:
  - other sleep disorders
  - medical/psychiatric disorders & medications
  - drug & medication abuse
  - shift work
  - jet lag

# Behavioural/Psychological Treatments

- Sleep Restriction
- Stimulus Control Therapy
- Sleep Hygiene
- Relaxation Training
- Phototherapy
- Cognitive Behavioural Therapy (CBTi)

# Sleep Restriction

Limits time spent in bed to average sleep duration:

- Fixed wake time
- Decrease sleep opportunity by later bedtime
- Gradually roll back bedtime when sleep latency and wake ups decrease

# Stimulus Control Therapy

Limits time spent awake in bed/deconditions pre-sleep arousal:

- Get up at the same time 7 days per week
- Only sleep & sex allowed in bedroom
- Sleep only in bedroom
- If awake >15-20 min. get up and return to bed when sleepy

# Sleep Hygiene

Education to address:

- excessive use of stimulant substances
- excessive use of alcohol & other drugs
- exercise, eating, drinking to late at night
- other behaviours increasing psychological and physiological arousal in the hours before or after bedtime

# Relaxation Training

Various relaxation techniques to lower psychological & physiological arousal:

- Breathing techniques
- Progressive muscular relaxation
- Visual imagery, Self Hypnosis
- Biofeedback
- Combinations of above



# Exercise & Diet

- Encourage regular exercise within clients capacity to promote at least weight maintenance if weight loss is unlikely
- Diet review and refer to Dietician if required

# Medications

- Review side-effects and possible interactions between medications that may cause insomnia

# Phototherapy & Melatonin

Bright light exposure - natural or artificial - sleep promoting effects

- Circadian system entrainment/phase shifting
- Direct antidepressant effects
- Melatonin phase shifting

# Cognitive Behavioural Therapy (CBTi)

Based on challenging irrational beliefs about sleep and associated problems:

- Didactic focus
- Paradoxical intention
- Cognitive restructuring

# Anna's Insomnia Case

- **Sleep initiation insomnia**
- ANNA, a 46-year-old academic, reported a 10-year history of difficulties falling asleep each night, and that the little sleep that she did have was not restorative. She said she worked late each night on her computer and when she went to bed she could not turn off her mind.

# Anna's Sleep Log

Name: Anna

Please complete this diary of your sleep and work habits for two weeks prior to your sleep study

Each Morning Complete The Following (see example below):

1. Write in the day and date
2. With an arrow pointing down mark the time you got into bed last night
3. With a plain line mark the time you think you fell asleep and woke up in the morning
4. With plain lines, mark times when you woke up and went back to sleep during the night
5. With an arrow pointing up mark when you got out of bed
6. With plain lines mark any naps you have during the day
7. With an X mark hours that you were at work
8. With an A and a number mark the number of glasses of alcohol you had during the day
9. With a C and a number mark the number of cups of coffee, tea or cola you had during the day

9. Answer the following questions → each day if applicable

Day	Date	8pm	9pm	10pm	11pm	12pm	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12noon	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	1	2	3	4	5	6	7										
1	T 8/9/03																										4		NO	6	NO												
2	W 9/9/03																											3.5		NO	6	NO											
3	T 10/9/03																											4		NO	6	NO											
4	F 11/9/03																											3.5		NO	6	NO											
5	S 12/9/03																											3.5		NO	6	NO											
6	S 13/9/03																											4		NO	6	NO											
7	M 14/9/03																											3.5		NO	6	NO											
8	T 15/9/03																											3		NO	6	NO											
9	W 16/9/03																											4		NO	6	NO											
10	T 17/9/03																											4.5		NO	6	NO											
11	F 18/9/03																											3.5	1	NO	6	NO											
12	S 19/9/03																											4.5		NO	6	NO											
13	S 20/9/03																											5.5		NO	6	NO											
14	M 21/9/03																											4		NO	6	NO											
		E X A M P L E																		E X A M P L E																							
																																						2.5	-	1	NO	6	NO

- List for question 5 above: did any of the following keep you awake at night
- |  |                             |
|--|-----------------------------|
| 1. Noise in the neighbourhood or house | 6. Mind too active          |
| 2. Children                            | 7. Need to go to the toilet |
| 3. Pain                                | 8. Worried about something  |
| 4. Too hot or cold                     | 9. Other                    |
| 5. Sleeping partner                    |                             |

Return to:  
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1. How much sleep did you get last night? (in hours and minutes)
2. How many hours did you use your CPAP last night?
3. How many times did you wake up during your sleep? (eg 0, 1, 2...)
4. Did you feel refreshed when you woke in the morning?
5. Did anything keep you awake? (use the list below)
6. Did you take any sleeping pills?

# Anna's Treatment

- She was given a list of behavioural and sleep hygiene tips and these were fully explained. CBTi was used to challenge various irrational ideas she had about her sleep.

# Relaxation for Anna

- Hypnosis/Relaxation – a session of hypno-relaxation was conducted and recorded. The induction consisted of progressive muscular relaxation for about 10 minutes followed by suggestions for deep sound sleep and an easy return to sleep after waking.



# Anna's Recovery

- Anna's sleep gradually improved over the following 6 weeks.
- She changed a lot of lifestyle factors
- She regularly used the hypno-relaxation CD to assist in initiating sleep
- She become much less worried and preoccupied with sleep.

# Summary of Anna's Case

- Behavioural treatments
- Psychological treatments
- Hypno-relaxation treatment
- Lifestyle changes
- Attitudinal changes
- Delivery of above within a CBTi context

# **THANK YOU**



# Selected References

**Kennedy, G. A. & Solin P (2004)** How to treat. Insomnia - Part 1.  
*Australian Doctor*, April 2, 37-44.

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*Australian Doctor*, April 9, 29-36.

**Kennedy, G. A. (2002)** A review of hypnosis in the treatment of parasomnias: Nightmares, sleepwalking and sleep terror disorders.  
*Australian Journal of Clinical and Experimental Hypnosis*, 30(2), 99-155.

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