

FAFP2 Pharmaceutical care II

Seminar:

Pharmaceutical care in sleep disorders - insomnia

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Learning outcomes

Pharmaceutical care in patients with:

- Sleep disorders
 - **insomnia**
 - **snoring**
- Understanding of normal sleep physiology
- Classification of insomnia
- Description of conditions that may disturb sleep
- Management of insomnia (pharmaceutical care in insomnia)



Normal sleep physiology - Sleep cycle

- controlled by reticular-activating system in brain
- consis of two states:
 1. **Rapid eye movement cycle** **REM cycle**
 2. **Non-rapid eye movement cycle** **NREM cycle**
- qality of sleep depends on the ration between the REM and NREM cycles

Sleep cycle

1. Rapid eye movement (REM) cycle

20 – 25 % of sleep (adults)

- REM sleep is associated with:
 - restoration of memory functions
 - repair of brain tissues
 - laying down of memories

- involved neurotransmitters:

catecholamines

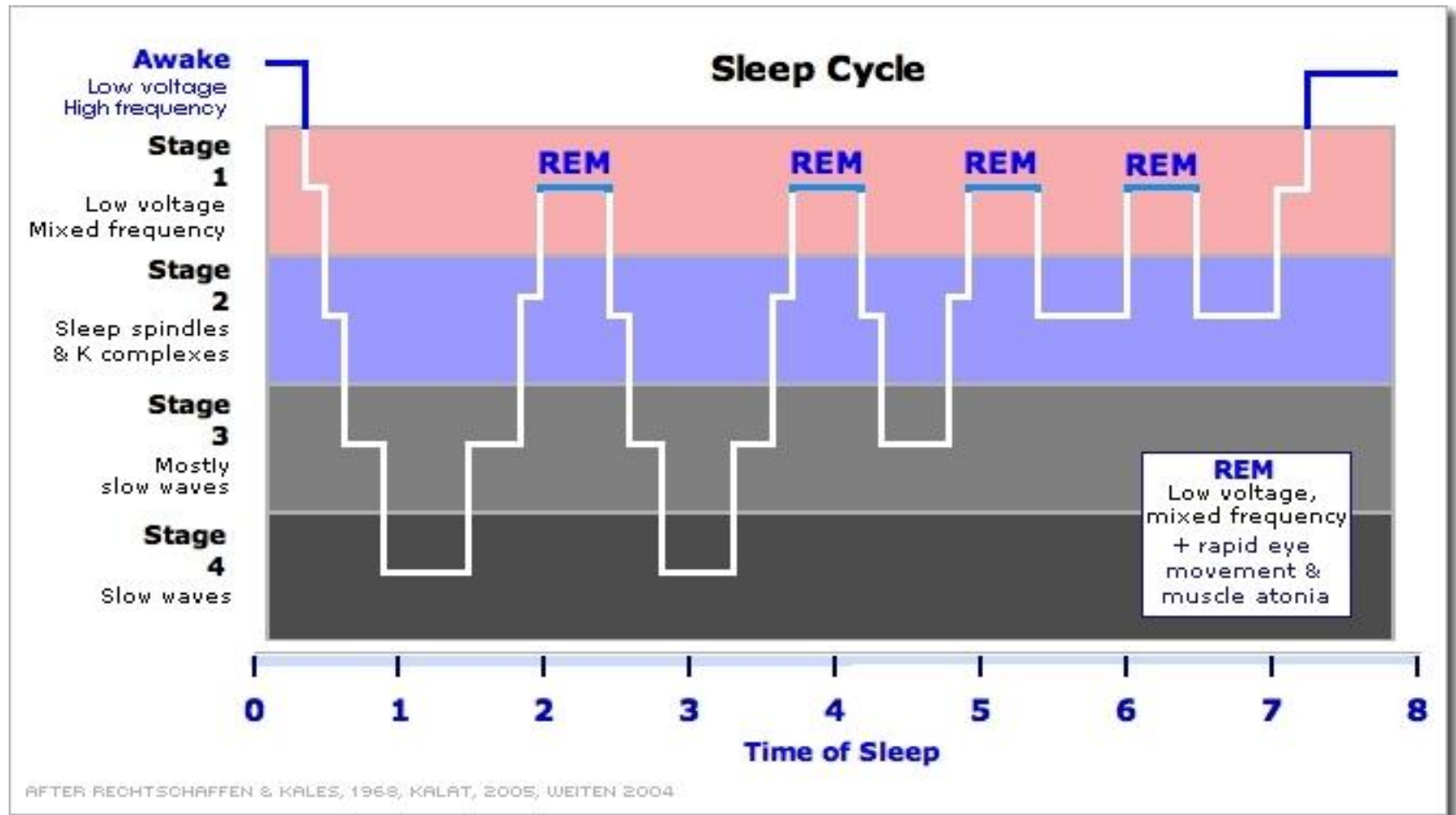
2. Non-rapid eye movement (NREM) cycle

75 – 80 % of sleep (adults)

- Non REM sleep is associated with:
 - repair of bodily tissues

- activating neurotransmitter:

serotonin



Disruption of the ration between NREM and REM sleep

Sleep disorders' Classification

1. **Insomnia**
2. **Breathing disorders associated with sleep**
3. **Hypersomnia of central origin**
4. **Circadian rhythm sleep disorders**
5. **Parasomnia**
6. **Movement disorders in sleep**
7. **Isolated symptoms, apparently normal variants and unresolved issues**
8. **Other sleep disorders**

Signs and symptoms of insomnia

- taking **more than 30 min to fall asleep**
- **difficulty to maintain sleep**
- sleep **disturbed for more than 3 nights a week**
- significant **impairment of daytime functioning**

Classification of insomnia

Insomnia - according to length:	Duration	Caused by	Type of patients
Transitional insomnia	2 – 3 days	external factors – jet lag, noise, ...	patients who normally do not complain of insomnia
Short-term insomnia	up to 3 weeks	physical or emotional trauma, work stress, pregnancy	sensitive patients to external trauma
Chronic insomnia	more than 3 weeks / month	psychiatric and neurological disorders, excessive alcohol consumption, some medicines	

Classification of insomnia

Insomnia - according to occurrence	Sleeping problem
Early insomnia	Difficulty to fall asleep
Middle insomnia	Waking-up during the night
Late insomnia	Waking-up earlier in the morning
Combined insomnia	Combined of above
Total insomnia	Total lack of sleep

Health disorders associated with insomnia

Psychiatric diseases

Neurological diseases

Somatic diseases

Pregnancy

Medicine-caused insomnia

Drugs with negative effect to REM sleep:

- **amfetamine**
- **nitrazepam**
- **amitriptyline**

Drugs that can disrupt the sleep:

- **Antiepileptic drugs**
- **Antidepressants**
- **Beta-blockers**
- **Calcium channel blockers**
- **NSAIDs**
- **levothyroxine**
- **PPI**

Snoring

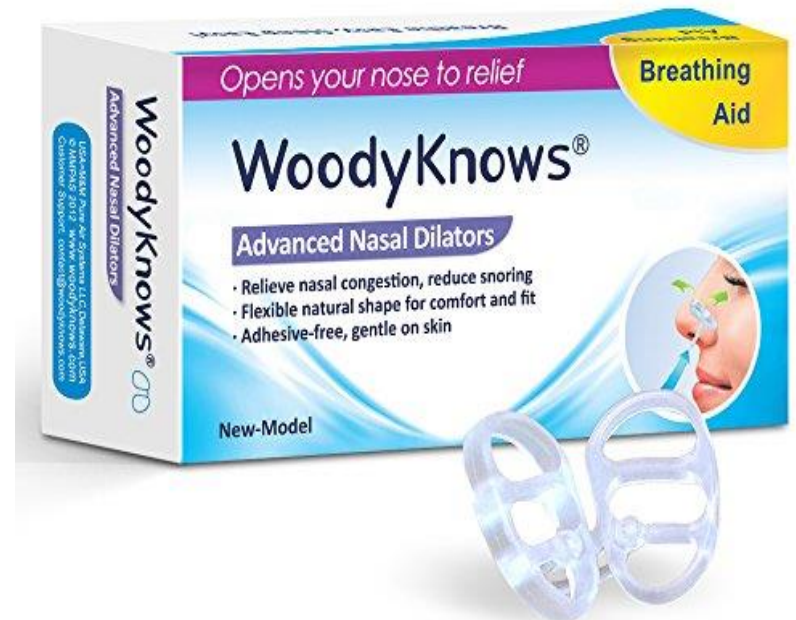
- vibrations of soft parts of the upper respiratory tract
- **simple snoring**
- affects up to **40 % of men**
- prevalence of snoring increases **with age**
- risk factors:
 - **obesity**
 - **alcohol intake**
 - **drugs (hypnotics, antidepressants, antipsychotics)**
 - **sleep apnoea**

Anti – snoring aids

Nasal strips



Nasal dilators



Anti – snoring aids

Mantibular devices



Pharmaceutical Care in Insomnia

Questions to be asked:

- How long do the difficulties take?
- Do you achieve sleep difficult?
- Is your sleep short?
- Is your sleep disturbed during night?
- After waking up do you feel tired?
- Ask for factors disturbing sleep
- Use of drugs?
- Other chronic diseases
- Pregnancy



Pharmaceutical Care in Insomnia

Treatment possibilities:

1. Investigation of sleep disorders
2. Non-pharmacologic treatment: Sleep hygiene
3. Non-pharmacologic treatment: Cognitive behavioral therapy
4. Pharmacological treatment – hypnotics, drugs with hypnotic effect
5. Pharmacological treatment – herbal drugs
6. Pharmacological treatment of insomnia in children

Investigation of sleep disorders

1. Medical history

Provide a detailed interview with patient and summarize medical history (find a risk drugs).

2. Recorders

Ask the patient to complete a sleep diary to understand sleep patterns, patient's lifestyle and symptoms.

Sleep Diary

Sleeping scales

Sleep diary

Sleep council UK, <https://sleepcouncil.org.uk/sleep-diary/>



Sleep Diary: END OF DAY
Complete at the end of the day

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Day of the week							
How many caffeinated drinks did you have BEFORE 5pm?							
How many caffeinated drinks did you have AFTER 5pm?							
How many alcohol units did you have BEFORE 5pm?							
How many alcohol units did you have AFTER 5pm?							
In minutes, how much exercise did you do today BEFORE 9pm?							
In minutes, how much exercise did you do today AFTER 9pm?							
Have you taken any medications today? And if so, what.							
Did you have a nap during the day or evening and for how long? (in minutes)							
Throughout the day have you felt any of the following: Grumpy Impatient Tired Moody Unable to concentrate							
In the hour before bed what has your bedtime routine included?							

For sleep tips and other helpful advice visit www.sleepcouncil.org.uk



Sleep diary

Sleep council UK, <https://sleepcouncil.org.uk/sleep-diary/>

Sleep Diary: MORNING
Complete each morning

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Day of the week							
What time did you go to bed last night?							
What time did you wake this morning?							
How long did it take you to first fall asleep (in minutes)?							
Did you fall asleep: Easily After some time With difficulty							
How many times did you wake in the night?							
How long were you awake during the night in total?							
How long did you sleep last night in total?							
What disturbed your sleep? (physical or mental factors such as stress, worry, noise, lights, comfort etc)							
How would you rate your quality of sleep from 1-5? (with 1 being very poor and 5 being very good)							
How do you feel this morning: Refreshed OK Lethargic							
Any other notes							

For sleep tips and other helpful advice visit www.sleepcouncil.org.uk

Epworth sleepiness scale

Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations?
Use the following scale to choose the most appropriate number:

0 no chance	1 slight chance	2 moderate chance	3 high chance	
Sitting and reading	0	1	2	3
Watching television	0	1	2	3
Sitting inactive, in a public space	0	1	2	3
Lying down to rest in the afternoon when circumstances permit	0	1	2	3
Sitting and talking to someone	0	1	2	3
Sitting quietly after a lunch without alcohol	0	1	2	3
As a passenger in car for an hour without a break	0	1	2	3
In a car, while stopped for a few minutes in traffic	0	1	2	3

Total Score:

Sleep hygiene

Provide sleep hygiene advice to patient.

- Establish a routine
- Lie down only when being tired
- Limit sleep through the day
- In the afternoon, limit caffeine, nicotine, heavy meals
- Use relaxation techniques

Cognitive behavioral therapy

Recommend Cognitive Behavioral Therapy to patient.

- type of personality
- the patient's motivation
- cooperation of the patient
- **eliminate false beliefs** that are involved in the development of insomnia
 - e. g. the need to sleep eight hours a day

Pharmacological treatment - hypnotics

Ideal hypnotic should met following criteria:

- The onset of sleep in **30 minutes**
- Induce model of **natural sleep for 6 - 8 hours**
- Keep the **physiological sleep architecture**
- To ensure **safe dosing**
- **No residual effects** the following morning
- It should not occur **tolerance and rebound insomnia**
- No interaction with **alcohol**
- No effect on **respiration**
- No interaction with **CNS depressants**

Guideline for using hypnotics

- The lowest dose
- The shortest period of use
- Intermittent use
- Not to increase the dose without the doctor
- Do not interrupt treatment without consulting the doctor
- Report a change of action, adverse reactions to the doctor
- Do not drink alcohol, do not take more sleeping pills together

Addiction to hypnotic

It can occur at any hypnotic

- **addiction, tolerance, somatic dependence**

Withdrawal syndrome

- in 1st generation after 3 months
- in the 2nd generation after 12 months

1st generations of hypnotics

barbiturates

- e.g. **phenobarbital**
- **non-barbiturates: clomethiazole**

2nd generations of hypnotics

Short-acting:

- triazolam
- midazolam
- cinolazepam

Medium-acting:

- nitrazepam
- flunitrazepam
- oxazepam

Long-acting:

- diazepam
- chlordiazepoxide

benzodiazepines (BZD)

The main indication of BZD:

- anxiolytics

Hypnotic indication of BZD - disadvantages:

- suppress REM sleep phase
- prolong only non-REM
- amnestic effects

3rd generations of hypnotics

Z - drugs

- it acts only on the benzodiazepine receptor BZD1
- selective hypnotic effect

- indication:
 - **sleep disorders, frequent nocturnal awakening, early awakening**

- **zolpidem**
- **zopiclon, eszopiclon**
- **zaleplon**

Pharmacological treatment – other drugs with hypnotic effect

Neuroleptics

- chlorprothixene, chlorpromazine, clozapine, tiapride, quetiapine, olanzapine

H1 antihistamines

- promethazine, bisulepin, dimetinden

Tricyclic antidepressants

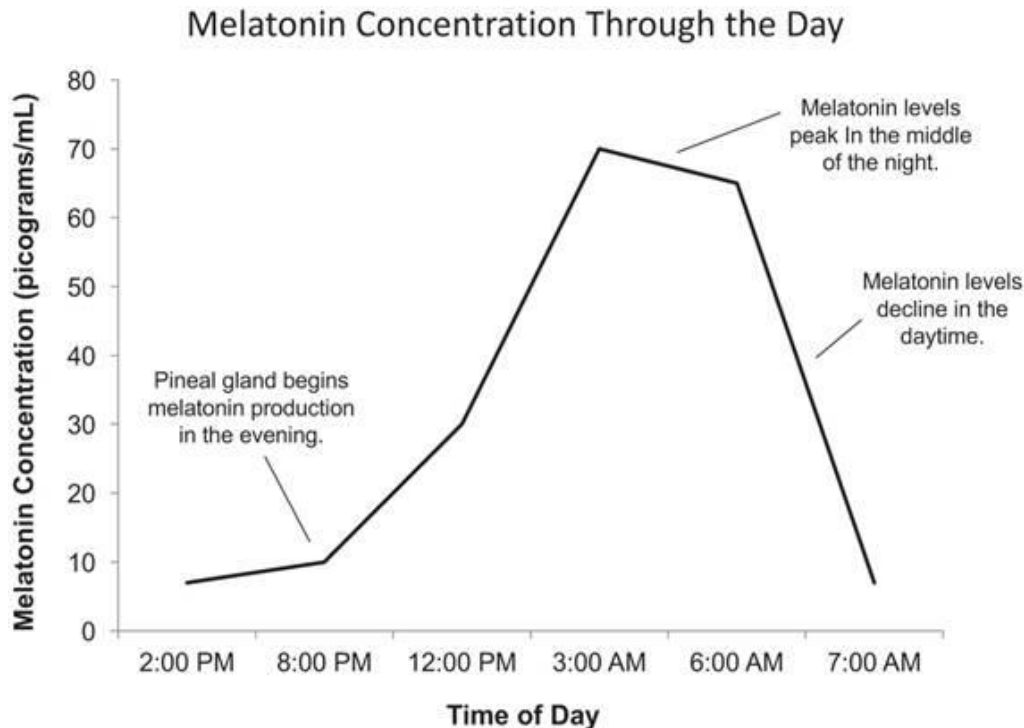
- amitriptyline, imipramine, clomipramine

Antidepressants – SARI, NaSSA

- trazodone
 - positively influences the architecture of sleep, shortens sleep, sleep deepens
- mirtazapine
 - strong antihistaminic effect causes a hypnotic effect, but also undesirable weight gain

Pharmacological treatment – hormone with hypnotic effect melatonin

- serotonin derivate
- excreted by the pineal gland **after reduction to light exposure of the retina**
- at the beginning of the night: melatonin production increases
- at the end of the night: melatonin production decreases



Effect of melatonin **administered before sleep:**

- reduces sleep latency
 - reduces sleep fragmentation
 - extending sleep length and sleep efficiency
- indication:
 - **jet lag syndrome**
 - **elderly insomnia**

2mg Circadin®

- **dosage:** 2mg in the evening 1-2 hours before bedtime
- **duration of treatment:** 3 weeks
- **indications:** short-term treatment of primary insomnia in patients over 55 years and over

ramelteon

- syntetic agonist of melatonin MT1 a MT2 receptors

Pharmacological treatment – herbal drugs

Hypericum perforatum

Melissa officinalis

Humulus lupulus

Valeriana officinalis

Passiflora

Pharmacological treatment of insomnia in children

- hypnotics – not recommended
- **sedative antihistamines**
- **mellisa, valeriana, passiflora**
- **homeopatics**
- **referral to physician**

- **solving of a primary cause of insomnia !!**
 - inappropriate sleep habits
 - night mares
 - psychotherapeutic techniques to remove anxiety
 - proper sleep hygiene

Thank you for your attention

