

# **Classification of sleep disorders**

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# Prevalence

- Sleep disorders occur in 10% of the population impacting daily live.
- Most frequent:
  - Insomnia (use of hypnotics !),
  - Sleep related breathing disorders,
  - Restless legs syndrome

# Classification sleep disorders

- **The old classification systems (1979, 1990, 1997):**  
according to cardinal symptom
  - Insomnia: poor sleep
  - Hypersomnia: too much sleep and/or EDS
  - Parasomnia: abnormal behaviour during sleep
- **International Classification of Sleep Disorders (2005; 2014):**  
according to pathophysiology
- **DSM-V** (Diagnostic and Statistical Manual of Mental Disorders)
- **ICD-10** (International Classification of Diseases - WHO)

# ICSD 3 (AASM): 7 categories

1. Insomnia
2. Sleep Related Breathing Disorders
3. Central Disorders of Hypersomnolence
4. Circadian Rhythm Sleep-Wake Disorders
5. Parasomnias
6. Sleep Related Movement Disorders
7. Other Sleep Disorder

Appendix: Sleep Related Medical and Neurological Disorders

# ICSD 3 (AASM): 7 categories

## 1. Insomnia

10%

- |  |             |
|--|-------------|
| 2. Sleep Related Breathing Disorders     | 3-7% or ↑   |
| 3. Central Disorders of Hypersomnolence  | 0,02- 0,18% |
| 4. Circadian Sleep-Wake Rhythm Disorders | 7-16%       |
| 5. Parasomnias (children/adults)         | 3-17%       |
| 6. Sleep Related Movement Disorders      | 5-10%       |
| 7. Other Sleep Disorders                 |             |

Appendix: Sleep Related Medical and Neurological Disorders

# Insomnia

- Subjective: Patients suffer from poor sleep
- Different dimensions:
  - Problem of initiating sleep
  - Problem of maintaining sleep
  - Problem of awakening too early in the morning
  - Being not refreshed in the morning
  - Combinations can occur
- Impact on daytime performance: sleepiness, fatigue, altered mood, irritation, memory and concentration problems, ...

# Insomnia: subtypes

- **Short-Term Insomnia Disorder**
  - Alternate names: Acute insomnia or 'adjustment' insomnia (35%); <3 M; fewer than three times per week on average
- **Chronic insomnia Disorder** (10%),  $\geq 3$  M;  $\geq 3$  times/w
  - Psychophysiological insomnia
  - Paradoxical insomnia
  - Idiopathic insomnia
  - Insomnia related to mental disorder
  - Inadequate sleep hygiene
  - Behavioural insomnia in children
  - Insomnia related to drug use/substance abuse
  - Insomnia related to a medical condition
- **Other insomnia Disorder**: for individuals that do not meet the full criteria (term to be used sparingly)
- **Isolated symptoms and normal variants**
  - Excessive time in bed
  - Short sleeper

# Chronic insomnia

- At least:
  - Problem to initiate sleep ( $> 30$  min)
  - Problem of maintaining sleep (in total  $> 30$  min)
  - Problem of awakening too early in the morning ( $< 6.5$  h sleep)
  - In children: resistance to go to bed on normal bed time
  - Problems to fall asleep without the intervention of a parent or a care giver (in case of dementia)
- Symptoms during daytime reported by patient or care giver
- While sufficient time and occasion to sleep
- At least 3x/week and during at least 3 months.
- Symptoms cannot be explained by another sleep disturbance.



# Idiopathic insomnia

## ■ Idiopathic insomnia

- From birth or early childhood
- No identifiable cause
- No long periods of remission
- 0.7% of adolescents; <10% of insomniacs
- Provoking or determining factors not known; association with a history of learning problems and ADHD, neurological defect ?
- Often severe objective insomnia

# ICSD 3 (AASM): 7 categories

1. Insomnia	10%
<b>2. Sleep Related Breathing Disorders</b>	<b>3-7% ?</b>
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Appendix: Sleep Related Medical and Neurological Disorders

# Sleep related breathing disorders

## Subcategories

- ❑ Obstructive Sleep Apnea Disorders
- ❑ Central Sleep Apnea Syndromes
- ❑ Sleep Related Hypoventilation Disorders
- ❑ Sleep Related Hypoxemia Disorder
- ❑ Isolated symptoms and Normal Variants

# Sleep related breathing disorders

## Obstructive Sleep Apnea Disorders

- Obstructive Sleep Apnea, Adult
- Obstructive Sleep Apnea, Pediatric

# Sleep related breathing disorders

## Central Sleep Apnea Syndromes

- ❑ Central Sleep Apnea with Cheyne-Stokes Breathing (CSB)
- ❑ Central Apnea Due to a Medical Disorder without CSB
- ❑ Central Sleep Apnea Due to High Altitude Periodic Breathing
- ❑ Central Sleep Apnea Due to a Medication or Substance
- ❑ Primary Central Sleep Apnea
- ❑ Primary Central Sleep Apnea of Infancy
- ❑ Primary Central Sleep Apnea of Prematurity
- ❑ Treatment-Emergent Central Sleep Apnea

# Sleep related breathing disorders

## Sleep Related Hypoventilation Disorders

- ❑ Obesity Hypoventilation Syndrome
- ❑ Congenital Central Alveolar Hypoventilation Syndrome
- ❑ Late-Onset Central Hypoventilation with Hypothalamic Dysfunction
- ❑ Idiopathic Central Alveolar Hypoventilation
- ❑ Sleep Related Hypoventilation Due to a Medication or Substance
- ❑ Sleep Related Hypoventilation Due to a Medical Disorder

# Sleep related breathing disorders

## Sleep Related Hypoxemia Disorder

- Sleep Related Hypoxemia

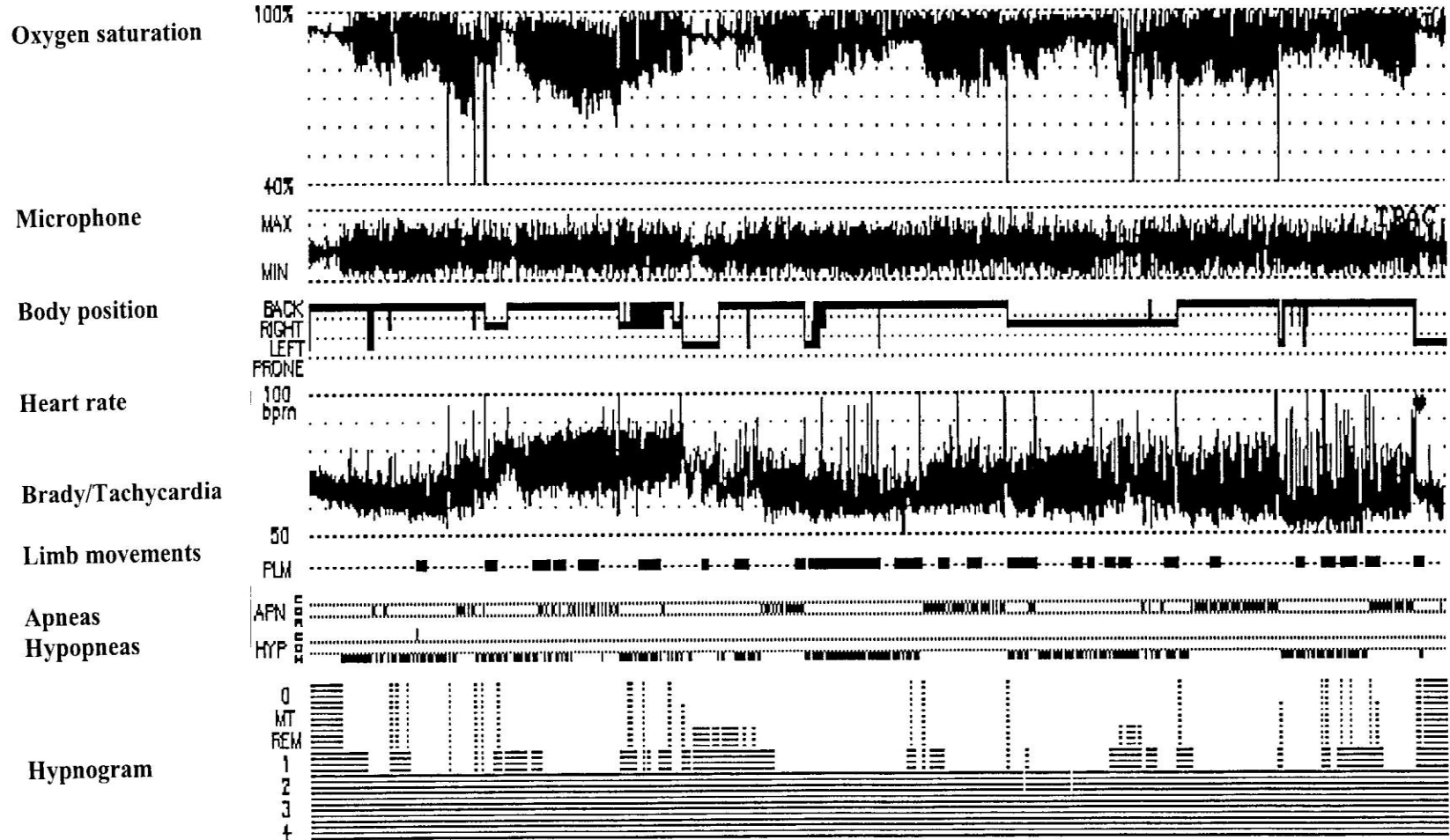
# Sleep related breathing disorders

## Isolated Symptoms and Normal Variants

- Snoring
- Catathrenia



# Severe (O)SAS



# ICSD 3 (AASM): 7 categories

- |  |                    |
|--|--------------------|
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| 2. Sleep Related Breathing Disorders           | 3-7% ?             |
| <b>3. Central Disorders of Hypersomnolence</b> | <b>0,02- 0,18%</b> |
| 4. Circadian Rhythm Sleep-Wake Disorders       | 7-16%              |
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Appendix: Sleep Related Medical and Neurological Disorders



# Hypersomnia of central origine

## ■ Adequate alertness

- Necessary for well-being and daytime functioning
- In case of problems: increased risk accidents

## ■ Hypersomnia

- Primary symptom:
  - undesired episodes of extreme daytime sleepiness or
  - increased need to sleep at night;
  - present for at least 3 months
- Cause: not related to disturbed sleep at night or disturbed circadian rhythm (if present, treat first)

# Hypersomnia: different subtypes

- ❑ Narcolepsy with cataplexy: type 1
- ❑ Narcolepsy without cataplexy: type 2
- ❑ Idiopathic hypersomnia
- ❑ Kleine-Levin syndrome
- ❑ Hypersomnia due to a medical disorder
- ❑ Hypersomnia due to a medication or substance
- ❑ Hypersomnia associated with a psychiatric disorder
- ❑ Insufficient sleep syndrome (behavioural)

# Hypersomnia subtypes: **narcolepsy**

- Excessive daytime sleepiness (sleep attacks)
- Cataplexy (muscle weakness provoked by emotions)
- Hypnagogic hallucinations (when falling asleep)
- Sleep paralysis (most often when awakening)
- Disturbed sleep quality at night

- Sleep latency  $\leq 8$  min,  $\geq 2$  SOREMP's
- **WITH hypocretin-1 level in CSF lower than 1/3 of normal value** in type I (=with cataplexy)
- **WITHOUT hypocretin-1 deficit** in CSF in type II (=without cataplexy)

# Hypersomnia subtypes: **idiopathic hypersomnia**

- Idiopathic hypersomnia *with* long sleep duration
  - EDS (almost daily, during > 3 M)
  - More than 10 h sleep/night, difficulty to wake up, also after long naps.
  - Often difficulty to awake and sleep drunk after awakening
  - Starts most often before 25 yrs, very rare (10x less than narcolepsy)
- Idiopathic hypersomnia *without* long sleep duration
  - See supra, but with 6 to 10 h sleep/night

- Polysomnography (PSG)
  - To exclude other sleep disorders
  - To confirm ><10 h sleep and shortened sleep latency
- MSLT: <8 min, < 2 SOREMP's

# Hypersomnia subtypes: recurrent hypersomnia

- Often recurring episodes of hypersomnia
- Usually associated with other symptoms
  - cognitive symptoms (confusion, hallucinations, derealisation,...)
  - Behavioural symptoms (irritability, aggression, binge eating, hypersexuality, ...)
- In normal periods: normal sleep and behaviour
- Clinical presentations:
  - Kleine-Levin syndroom
    - Episodes of hypersomnia of some days to different weeks, at least 1x to 10x per year
    - Often preceded by fatigue/headache
    - Sleep 16-18h/day
    - Extremely rare, more often in men (4:1)
  - Menstrual cycle related
  - Subtypes



# Hypersomnia subtypes: **behavioural** (chronic sleep insufficiency)

- EDS (almost daily, during >3 M)
- Habitual sleep duration based on sleep diary or actigraphy is shorter than expected according to normal data of the age group
- Sleep longer when sleep schedule is not kept (weekend, holidays)
- Individual does not succeed in a consistent way to get the quantity of sleep needed to keep normal alertness.
- Voluntarily, but not-intentional chronic sleep deprivation.

- PSG not necessary, but demonstrates sleep latency of < 10 min and SEI of > 90%
- MSLT < 8 min

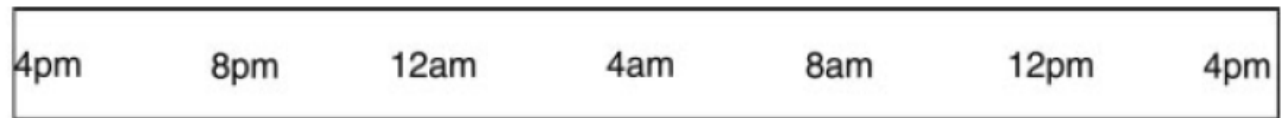
# Hypersomnia subtypes: other causes

- Psychiatric disturbances
- CVS, postviral hypersomnia
- Posttraumatic hypersomnia
- Neurological disorders
- Normal variants (long sleepers, ..)
- ...

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Appendix: Sleep Related Medical and Neurological Disorders



Delayed sleep  
phase



Advanced sleep  
phase



Conventional  
sleep time



Irregular sleep-  
wake rhythm



Free running  
type



# Circadian sleep-wake rhythm disorders

- Delayed sleep-wake phase disorder
- Advanced sleep-wake phase disorder
- Irregular sleep-wake rhythm disorder:
  - min. 3 episodes of sleep over 24 h
  - Total sleep time within 24 h is normal according to age
- Non-24-hour sleep-wake rhythm disorder
  - Sleep cycle of more than 24 h (in blind people)
- Shift work disorder
- Jet lag disorder
- Circadian Sleep-Wake Disorder Not Otherwise Specified

Lead to  
insomnia,  
EDS, or  
both

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Appendix: Sleep Related Medical and Neurological Disorders

# Parasomnias

## ☐ NREM-related parasomnias

### ■ Arousal disorder

- ☐ Confusional arousals
- ☐ Sleep walking (somnambulism)
- ☐ Sleep terrors (pavor nocturnus)
- ☐ Sleep related eating disorder

## ☐ REM-related parasomnias

- ☐ REM-sleep behaviour disorder – RBD
- ☐ Recurrent Isolated sleep paralysis (once or repetitive)
- ☐ Nightmare Disorder

## ☐ Other parasomnias

# Other parasomnia

- ❑ Exploding head syndrome
- ❑ Sleep related hallucinations
- ❑ Sleep Enuresis
- ❑ Parasomnia due to a medical disorder
- ❑ Parasomnia due to a medication or substance
- ❑ Parasomnia, unspecified

## *Isolated symptoms and normal variants*

- Sleep Talking



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Appendix: Sleep Related Medical and Neurological Disorders

# Sleep Related Movement Disorders

## □ In general

- Relatively simple, most often stereotypical movements during sleep (while most often complex behaviour in parasomnia)
- Condition: disturb sleep or contribute to complaints of sleepiness or fatigue
- Some movements during sleep are normal or even desirable, hypnagogic jerks, depending of their intensity and frequency

## □ Disorders

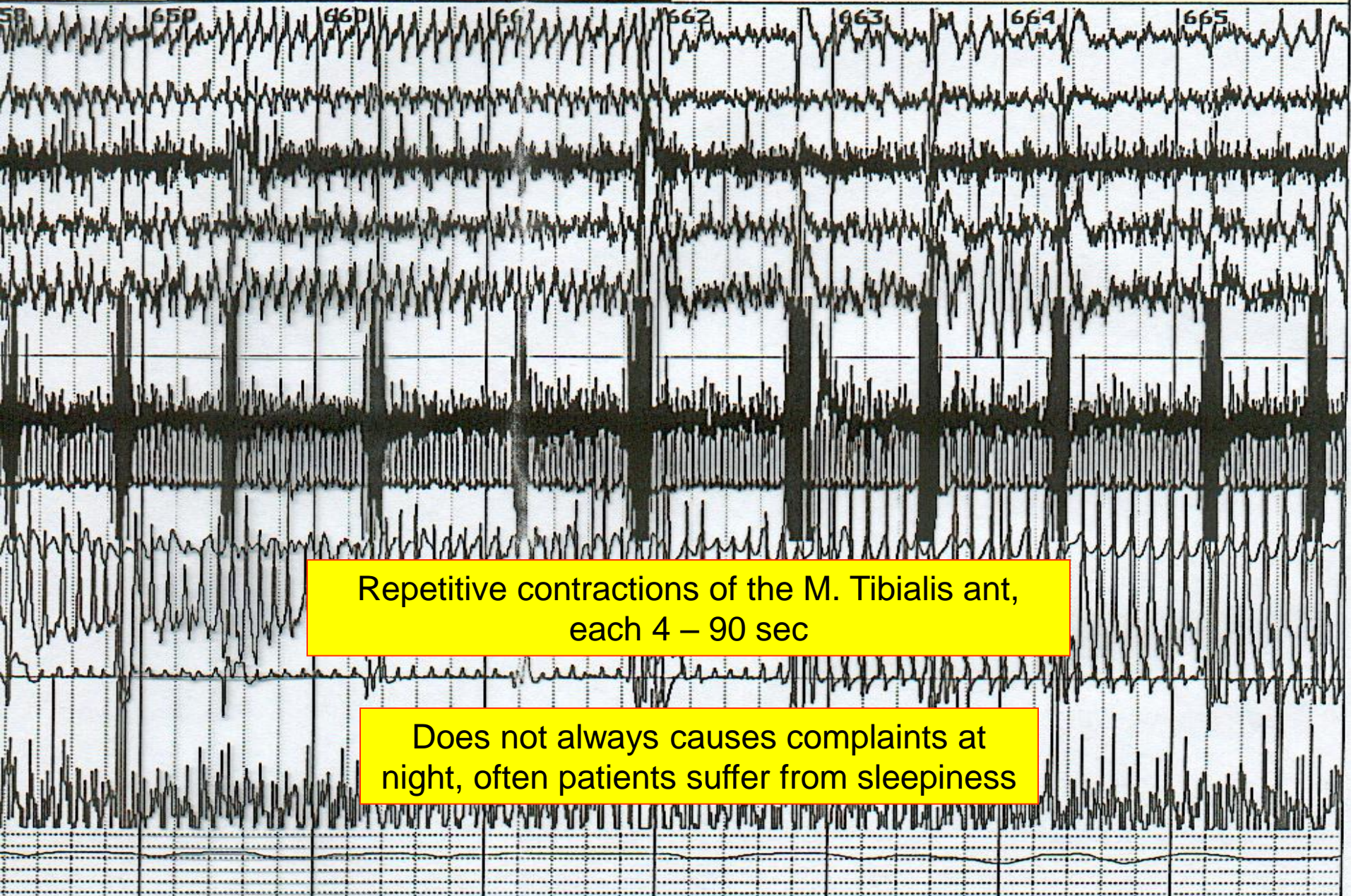
- Restless legs syndrome
  - (urge to move the legs, due to an irritant and inconvenient sensation in the legs)
  - (Sensations disappear partially or completely by movement, like walking or stretching)
- Periodic leg movement disorder
- Sleep related leg cramps
- Sleep related bruxism
  - Children: 14-17%, adolescents and young-adults :12%, elderly: 8%



Sleep

222222222222202222222222

Stages



Repetitive contractions of the M. Tibialis ant,  
each 4 – 90 sec

Does not always causes complaints at  
night, often patients suffer from sleepiness

54 - 04:18:54

Epoch: 656

■■■■■■

Speed: 1 mm/sec

60 Hz Filter: ON

Event:



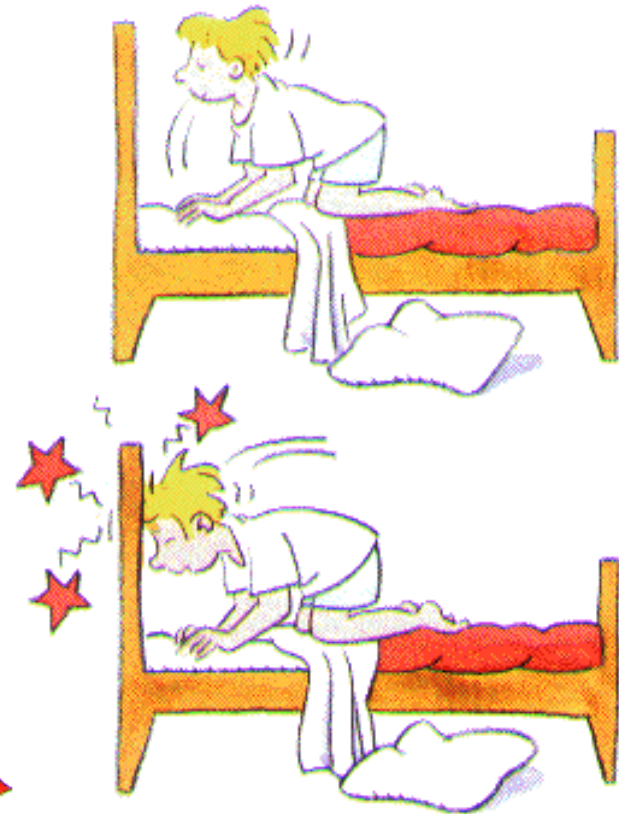
# Sleep Related Movement Disorders

## Sleep related rhythmic movement Disorder

- Head banging/rolling,
- Body rocking/rolling,
- Leg banging/rolling

## Isolated symptoms and normal variants:

- hypnic jerks



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# Appendix: Other Sleep Disorders

- ❑ Fatal familial insomnia
- ❑ Sleep related epilepsy
- ❑ Sleep related headache
- ❑ Sleep related laryngospasm
- ❑ Sleep related gastro-esophageal reflux
- ❑ Sleep related myocardial ischemia