

PARASOMNIAS AND SLEEP RELATED MOVEMENT DISORDERS AN OVERVIEW

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Grant/Research Support	NONE
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PARASOMNIAS AND SLEEP RELATED MOVEMENT DISORDERS

OBJECTIVE: Develop an understanding of the following disorders and when they occur and what to do about it



Awakening

- Sleep Paralysis
- Sleep Related Seizures
- Hypnic Jerks



Day

- Narcolepsy



Evening

- RLS
- Rhythmic Movement Disorder



1st ½ Night

- Confusional Arousals
- Sleepwalking
- Sleepwalking
- Night Terrors



2nd ½ Night

- Nightmares
- REM Behavior Disorder (RBD)

I WANT TO BE SEDATED



OBJECTIVES

- Understand how sleep deprivation may shift sleep time into the day and how wake time may shift into the night.
- Understand the association between sleep deprivation and parasomnias.
- Know some features of common parasomnias.
- Know the treatment for common parasomnias.
- Be aware of two common sleep related seizure disorders.



Typical Child



SLEEP DEPRIVATION AND PARASOMNIAS

Normal Sleep Time

Ages 5-12 10-11 hours/night

Ages 13-19 9-10 hours/night

Adults 7.5-9 hours/night

Actual Sleep Time

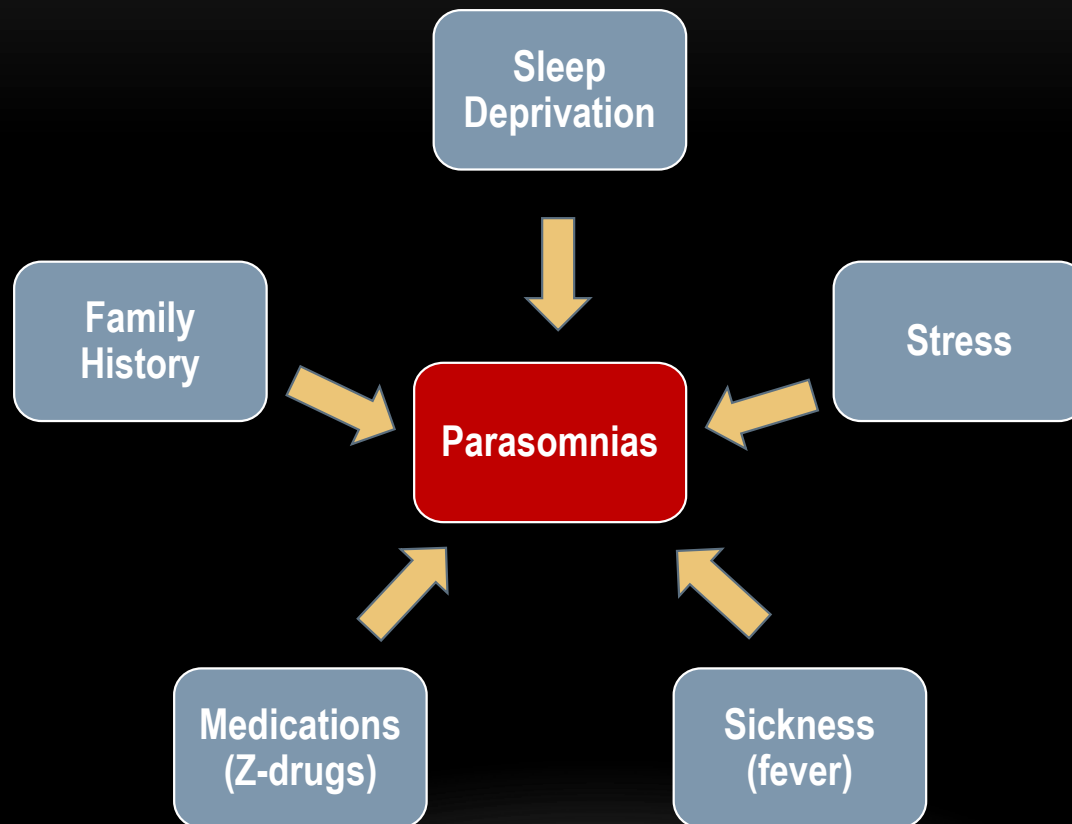
Ages 5-12 - 9 hours

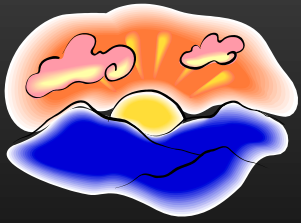
Ages 13-19; 6-7 hours

Adults < 6.5 hours

Parasomnias

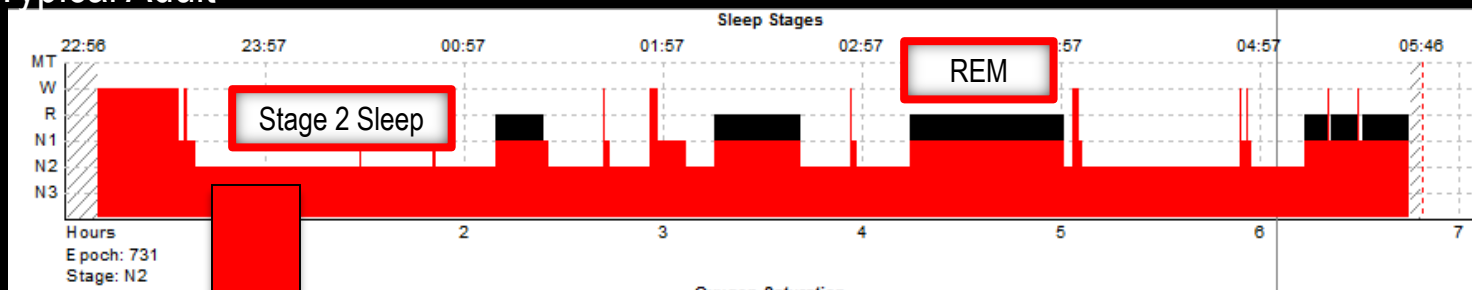






Sleep Deprivation
Increased Risks of Parasomnias
First night following sleep deprivation the brain
recovers with stage III sleep

Typical Adult



Typical Child



CASE

- Medical student Curious George comes to your office because many mornings, upon awakening, he is unable to move. He can move his eyes but his body feels paralyzed. Paralysis may last seconds to minutes.
- Your response:
 - Sounds psychiatric – refer to psychiatry
 - Ask about drug and alcohol problems
 - Ask about how many hours does he sleep at night



SLEEP PARALYSIS

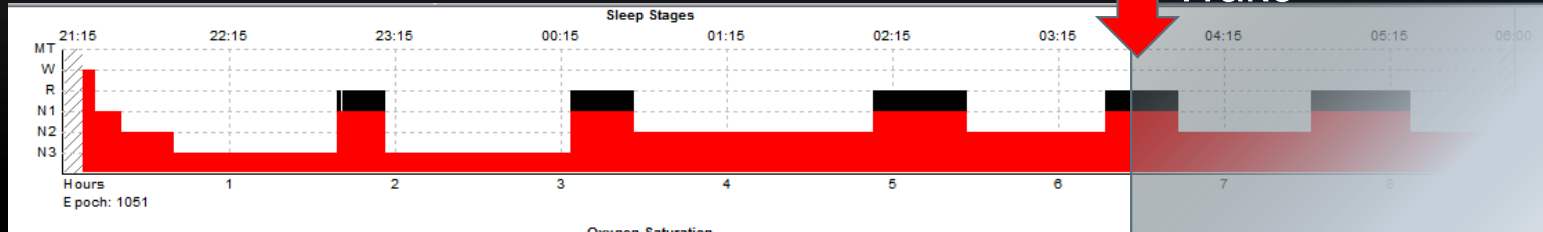
- Transient inability to move, despite being fully awake
- Brief persistence of atonia of REM lingering into wakefulness
 - 40% of teens and college students
 - 10% of adults
- Triggered by sleep deprivation



Sleep Paralysis



Wake



Shortened Sleep time

- School
- TV
- Work

Wake up when REM sleep normally occurs

- Wake up during REM

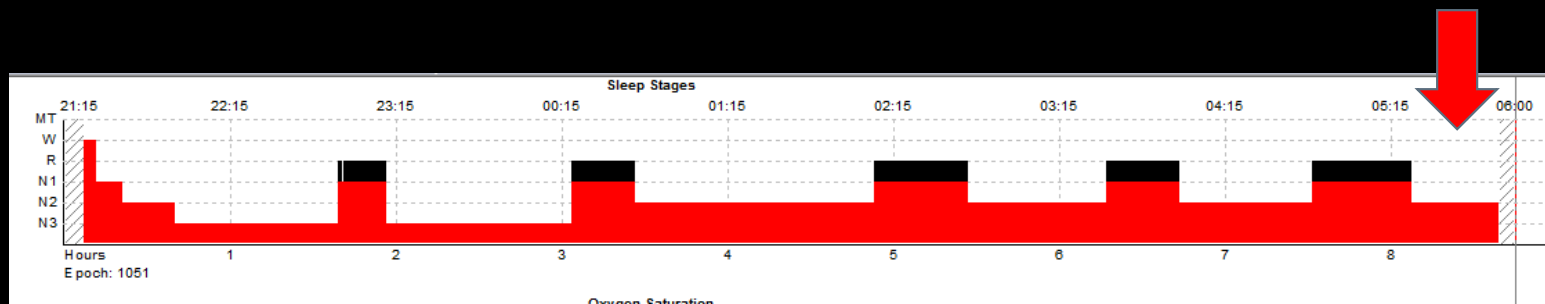
Atonia of REM is present

- Awake
- Eyes open
- Unable to move



SLEEP PARALYSIS

- Has been reported to occur in families
- SSRIs can be effective when frequent and bothersome
- Key: sleep one more hour!
- Move wake up time beyond REM sleep



CASE

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- Your response:
 - Sounds psychiatric – refer to psychiatry
 - Ask about drug and alcohol problems
 - **Ask about how many hours does he sleep at night**
 - **Try to sleep 7.5-9 hours each night!**

CASE

- Mother presents with her 13 year old girl and states that she is excessively sleepy during the day and experiences hallucinations when going to sleep or waking up.
- While waiting in the office the receptionist tells a very funny joke. The girl begins to laugh and then falls to the floor:
- Your response:
 - Listen to her heart and lungs
 - Hit her with a hammer
 - Tell the receptionist that you want to hear a joke so funny that you will fall down also





NARCOLEPSY WITH CATAPLEXY

SLEEP ENTERING INTO WAKE

- Defect: loss of Hypocretin
- Atonia, an element of REM sleep is expressed into wakefulness
- Symptoms:
 - Excessive daytime sleepiness
 - Sleep paralysis
 - Hypnagogic hallucinations
 - Cataplexy





NARCOLEPSY WITH CATAPLEXY

SLEEP ENTERING INTO WAKE



- Emotional stimuli stimulates the atonia of REM - laughter
- Patients retain consciousness
- Reflexes absent
- Treatment:
 - ✓ Get good sleep
 - ✓ SSRI
 - ✓ Modafinil
 - ✓ Sodium oxybate

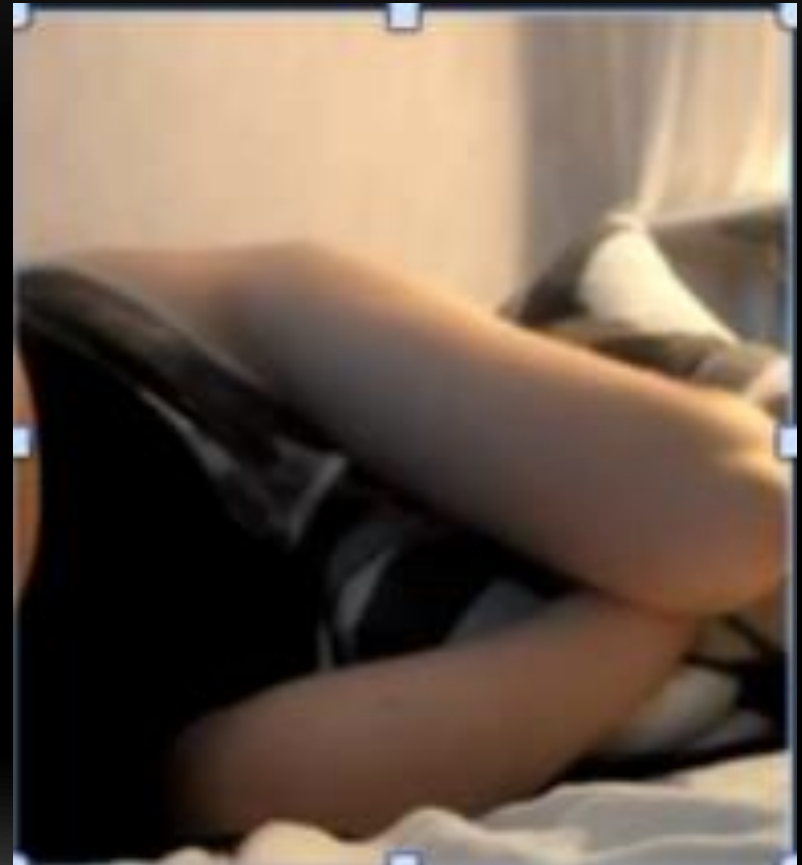
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- While waiting in the office the receptionist tells a very funny joke. The girl begins to laugh and then falls to the floor:
- Your response:
 - Listen to her heart and lungs
 - **Hit her with a hammer – no reflexes**
 - Tell the receptionist that you want to hear the joke



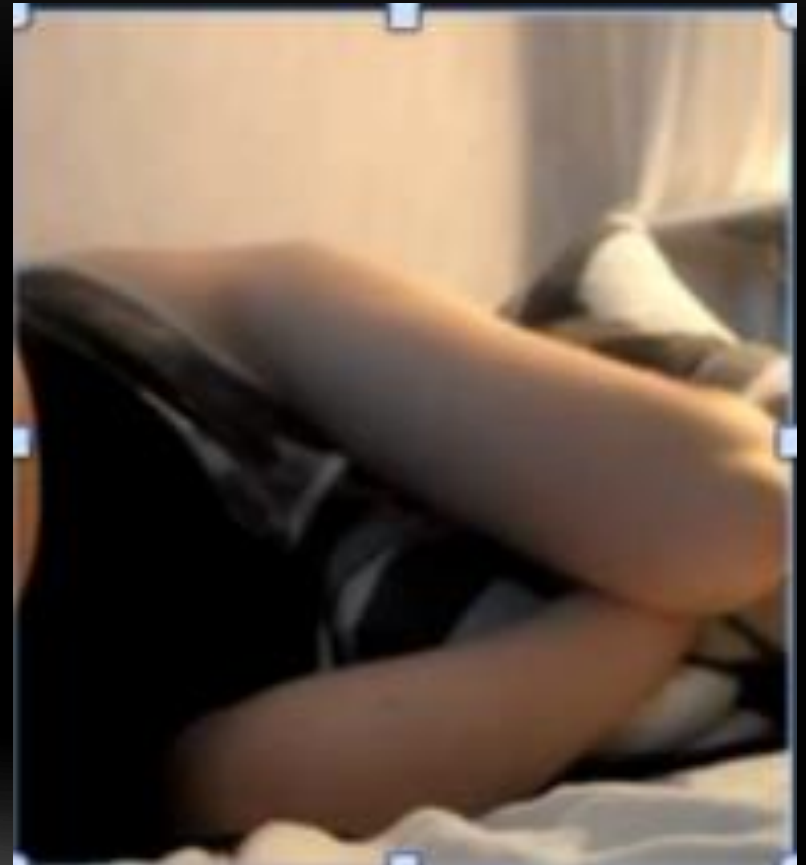
CASE

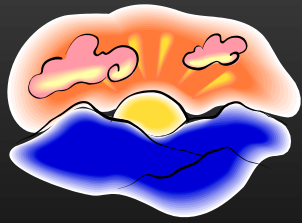
- Dr. Zhivago from Taos, NM is worried because he has feelings of falling. The symptoms occur almost every time he is post call. His arms are stretched out when this occurs as if he really is falling.
- Your response:
 - Send to psychiatry
 - Reassurance and tell him to sleep more
 - Reassurance and let him know his body will get use to sleeping less



HYPNIC JERKS = SLEEP STARTS

- One or two abrupt myoclonic flexion jerks, often accompanied by a feeling of falling
- Cause:
 - Insufficient sleep





HYPNIC JERKS

HYPNIC HALUCINATIONS

- Occur at sleep onset
- Vivid perceptual experiences
- Sensation of hearing voices
- Feeling someone else is nearby
- Precipitated by
 - Sleep deprivation
 - Excessive caffeine
 - Emotional stress
 - Narcolepsy



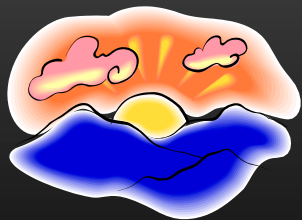
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CASE

- Female patient states she has a restless feeling in her legs. It occurs in the evenings, if she gets up, the symptoms go away. Her partner is demanding that something be done as he is tired of being kicked every night
- Your response:
 - Check ferritin levels
 - Change antidepressant to mirtazipine
 - Symptoms are part of her depression
 - Tell the partner to buy shin protectors





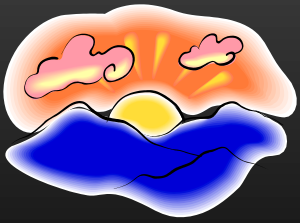
RESTLESS LEGS SYNDROME

- Clinical Diagnosis

URGES

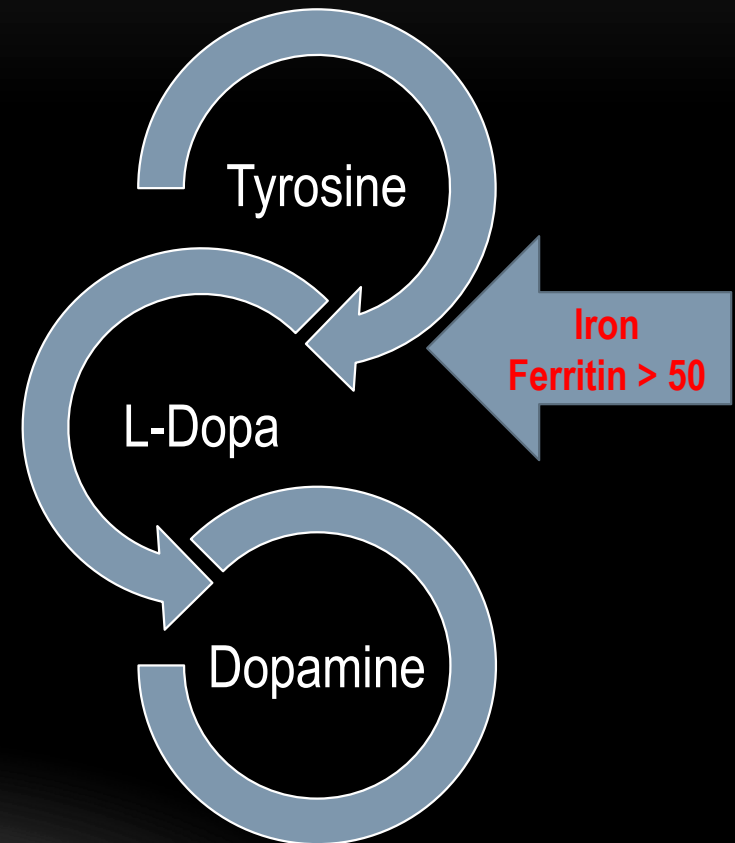
- ✓ **U**rge to move legs
- ✓ Happens at **R**est
- ✓ **G**et up, symptoms improve
- ✓ **E**vening – when it occurs
- ✓ **S**ymptoms – no other cause

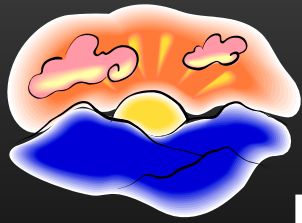
- If there is any other symptom that may be causing the RLS then it's not RLS:
 - Neuropathy
 - Statins
 - Positional discomfort
 - myalgias
- Increased symptoms with any iron deficient state
- Increased symptoms with antidepressants particularly mirtazapine
 - 9% all AD
 - 28% mirtazapine



RESTLESS LEGS SYNDROME

- Tyrosine converted to Dopamine
- Rate limiting step
- Tyrosine hydroxolase requires iron as a co-factor
- Measured indirectly by measuring ferritin
- Levels < 50 are associated with increased symptoms of RLS

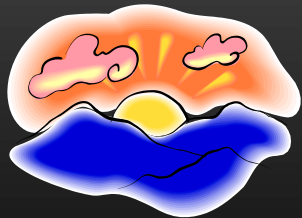




80% OF RLS PATIENTS WILL HAVE PERIODIC LIMB MOVEMENTS IN SLEEP (PLMS)

- Involuntary unilateral or bilateral limb movements which occur periodically during sleep
- Usually involves the legs
- Most frequently found in NREM II
- Occurs in 1-4% of children
- Antidepressants may increase prevalence by 5 fold





TREATMENT OF RLS/PLMS

1st

- Replace iron if ferritin is < 50
- Ferrous gluconate 325 mg with Vitamin C

2nd

- Dopamine agonists, e.g. pramipexole, ropinerole, rotigotine patch. Monitor for compulsive behavior.
- $\alpha 2\delta$ ligands, e.g. gabapentin, pregabalin. Promotes slow wave sleep and REM sleep.

3rd

- Opioid-like drugs, e.g. tramadol, codeine

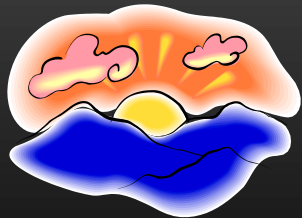
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- Female patient states she has a restless feeling in her legs. It occurs in the evenings, if she gets up, the symptoms go away. Her partner is demanding that something be done as he is tired of being kicked every night
- Your response:
 - **Check ferritin levels – goal: > 50**
 - Change antidepressant to mirtazipine
 - Symptoms are part of her depression
 - Tell the partner to buy shin protectors



CASE

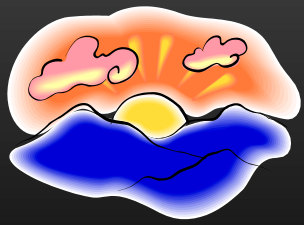
- Parents are concerned that their 6 month old rocks and hits his head on the crib until he rolls over and falls asleep. They are concerned about eventual brain damage.
- Your response:
 - Let the child fall asleep to the Rolling Stones “I Only Rock n Roll and I Like It”
 - Reassurance and place pillows at places he hits his head
 - Medicate with thorazine (the parents, not the child)



RHYTHMIC MOVEMENT DISORDER

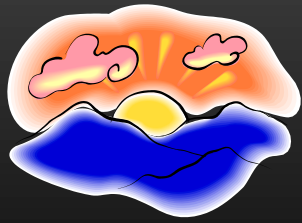
- 10%
- Rhythmic head banging
- Body rocking
- Leg rolling
- 66% of 9 month old babies
- 8% by age 4
- Prevalence in adults is not known
- Typically persists in those with neurodevelopmental and psychiatric disorders
- May follow head trauma





RHYTHMIC MOVEMENT DISORDER

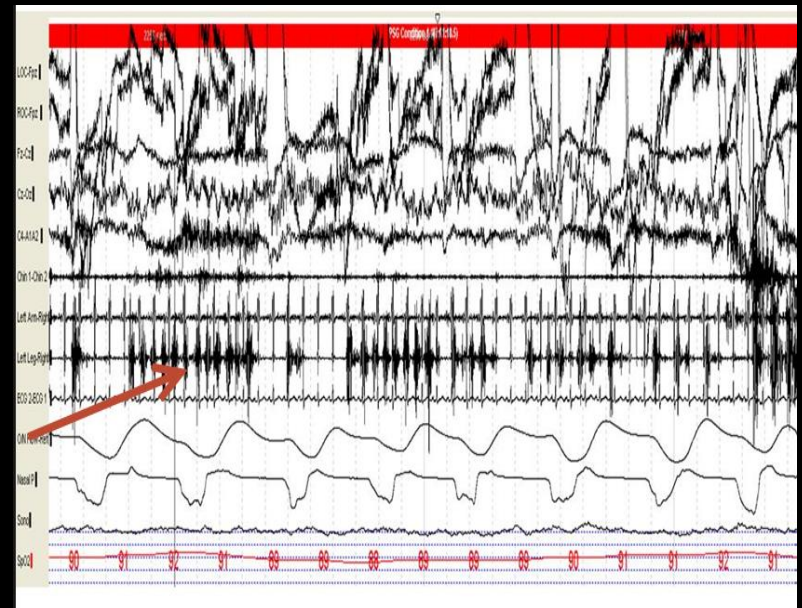




RHYTHMIC MOVEMENT DISORDER

HYPNAGOGIC FOOT TREMOR

- Hypnagogic foot tremor (HFT)
- Occurs during the transition from wakefulness to sleep
- May linger into stages NREM I and NREM II
- 5-8% of adults
- May involve one or both feet
- Rarely disturbs the patient
- Oscillating movements of the toes or whole foot, occurring q 1-2 seconds
- Benign



CASE

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CASE

- 45 year old female woke up and found herself in her nightgown in the middle of the street at 1 AM with a bag of ham in one hand and a knife in the other. She sleep walked as a child, however symptoms resolved by age 13.
- Your response:
 - Lock the doors better
 - Fill the fridge with chicken, as ham may induce psychosis
 - Sleep more
 - Eat a larger meal in the evening





SLEEP TALKING

- 50-80% of children
- 5% of Adults
- ?% of cats
- 50% sleep talk only a few times per/year
- 10% sleep talk nightly
- Risk increases with:
 - Sleep deprivation
 - Stress
 - Sickness (fever)
 - Medications
 - Family History



SLEEP TALKING





CONFUSIONAL AROUSALS

- 17% of children
 - 4% of adults
 - Begin with a sudden arousal from NREM III sleep
 - Patient sits up in bed, fumble with bedclothes, mutter unintelligible words
 - Typically lay down, but may proceed to sleepwalk or sleep talk
- Risk factors
 - Sleep deprivation
 - Stress
 - Sickness (fever)
 - Medications
 - OSA
 - Psychiatric disorders increase risk 13 fold



CONFUSIONAL AROUSALS

- Risk factors:
 - Sleep deprivation
 - Stress
 - Sickness (fever)
 - Medications
 - OSA
 - Psychiatric disorder: bipolar or anxiety
 - ✓ Risk increase 13 fold



SLEEP TERRORS

- 40% children
- 2% adults
- Individuals are:
 - 95% family history
 - 3-5 times more likely to have OSA
 - Have nightmares > once/month
 - Prone injury-causing behaviors during sleep





VIOLENT BEHAVIOR DURING SLEEP (VBS)

- VBS occurs in 1.6% of adults
- VBS: Range from simple dream enactment to complex behaviors
- VBS:
 - Risk factors:
 - ✓ Family member with VBS
 - ✓ Age < 35
 - ✓ Sleep deprivation
 - ✓ Stress
 - ✓ Alcohol



Scucs et al, Medical Hypotheses 2014
Ohayon et al, Sleep Medicine 2010



VIOLENT BEHAVIOR DURING SLEEP (VBS)

- VBS:
 - Occur in the first 2 hours of sleep
 - 79% of people have vivid dreams
 - 31% hurt themselves or someone else
 - Few people consult a physician



Scucs et al, Medical Hypotheses 2014
Ohayon et al, Sleep Medicine 2010



SLEEPWALKING

UK -4924 adults

- 4% sleep walked at least twice a year
- 40% lifetime prevalence
- Highest incidence is ages 4-8
- Sleepwalking generally stops by age 13

US-19,136 adults

- 3% reported nocturnal wandering at least once in the previous year
- 30% lifetime prevalence
- 30% had a relative who had nocturnal wandering
- 1% reported at least two nocturnal wanderings in the previous month



SLEEPWALKING

- Occurs in NREM III
- Patients arise from bed, walk toward a sound or light
- Sleepwalkers may run through the house
- Behavior is often followed by a calm return to bed, or lying down somewhere else in the house
- Patients appear confused
- Eyes are open, but objects are misidentified
- Patients are slow to respond
- Patients are difficult to arouse
- Patients often suffer retrograde amnesia

SLEEPWALKING



• Click to add text





SLEEPWALKING

- New onset or late recurrence in teenage years warrants consideration of other primary sleep disorders
 - Sleep deprivation
 - Extreme fatigue
 - Obstructive sleep apnea
 - RLS
 - RBD
 - Infections
- Stressful life events often precipitate sleepwalking
 - Changes in sleep environment
 - Family conflicts
 - Personal conflicts
 - Medications



SLEEP BRUXISM

- Teeth grinding during sleep
- 30-40% of children
- 8% of young adults
- Symptoms of tooth-grinding noises, jaw muscle discomfort, abnormal wear of teeth on dental exam
- Risk factors
 - Emotional stress
 - Caffeine
 - Type A personalities





NREM PARASOMNIAS

WHEN TO TREAT?

- Behaviors are dangerous
- Presence of daytime sleepiness
- Psychosocial impairment
- Affecting function
- Injuries

CASE

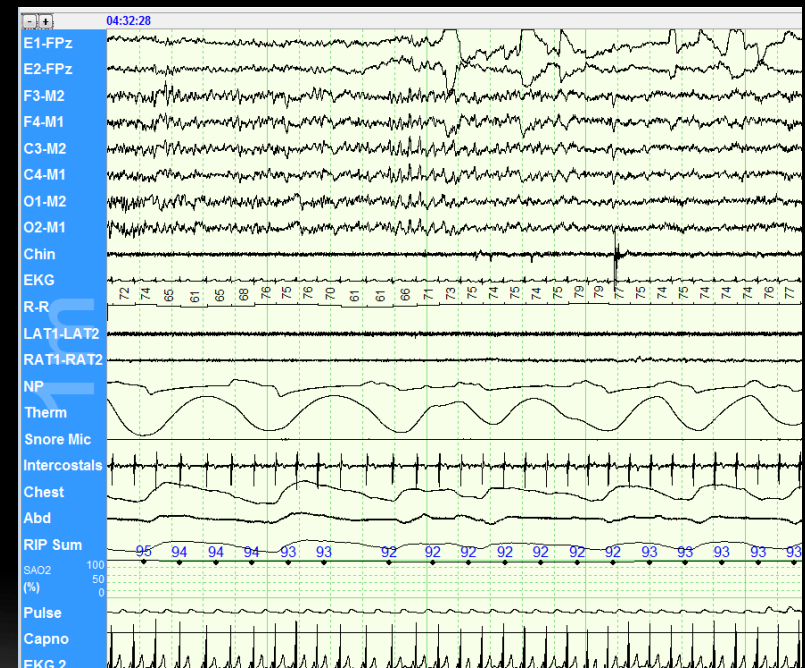
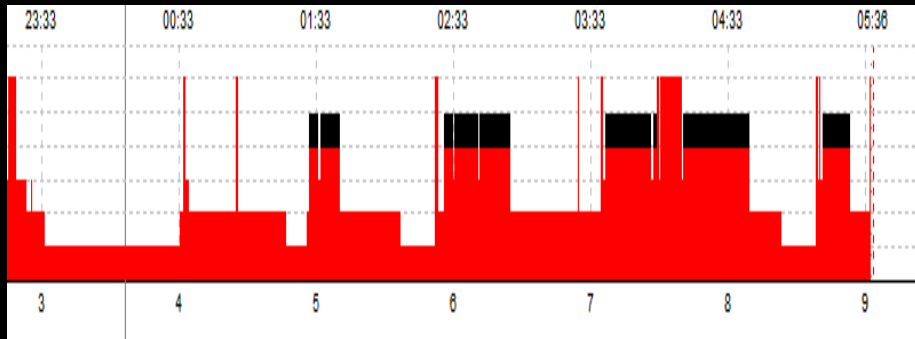
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- Your response:
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 - **Sleep more**
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PARASOMNIAS DURING REM SLEEP

TYPICALLY SECOND HALF OF THE NIGHT





NIGHTMARE DISORDER

- 10-15% of children ages 3-6
- 20-40% children overall
- 5-12% adults
- Long, involved frightening in REM sleep
- May be caused by a daytime traumatic experience, medications, or disruption in routine
- Preceded by increased heart rate, increased respiration, increased REM





NIGHTMARE DISORDER

- Reduced movement during sleep
- Freezing:
 - Heightened anxiety consistent with the suppression of movement exhibited by animals under conditions of perceived threat
- Treated
 - Reassurance
 - Medications that decrease REM sleep



Steinsbeckk, J of Dev Beh Pediatrics 2014
Haupt, Pediatric Annals 2014

CASE

- 67 year old male with Parkinson's disease comes with his wife, who reports that at in the early mornings, the patient has hit her, choked her and a few time kicked his leg with such force that he has "flown" out of bed. He used to be a soccer player.
- Your response"
 - "Bad man, bad man, bad man"
 - Send couple to counseling to uncover psychological issues that are affecting the relationship
 - Antipsychotic medication, i.e. Haldol
 - Melatonin



REM SLEEP BEHAVIOR DISORDER IN CHILDHOOD (PHYSICALLY ACTING OUT DREAMS)

- Associated with
 - Neurodevelopmental disabilities
 - Narcolepsy
 - Medication use
- Mean age at diagnosis is 9.5 years
- 75% male prevalence
- Nightmares occur in >75%
- Excessive daytime sleepiness occurs in 30%

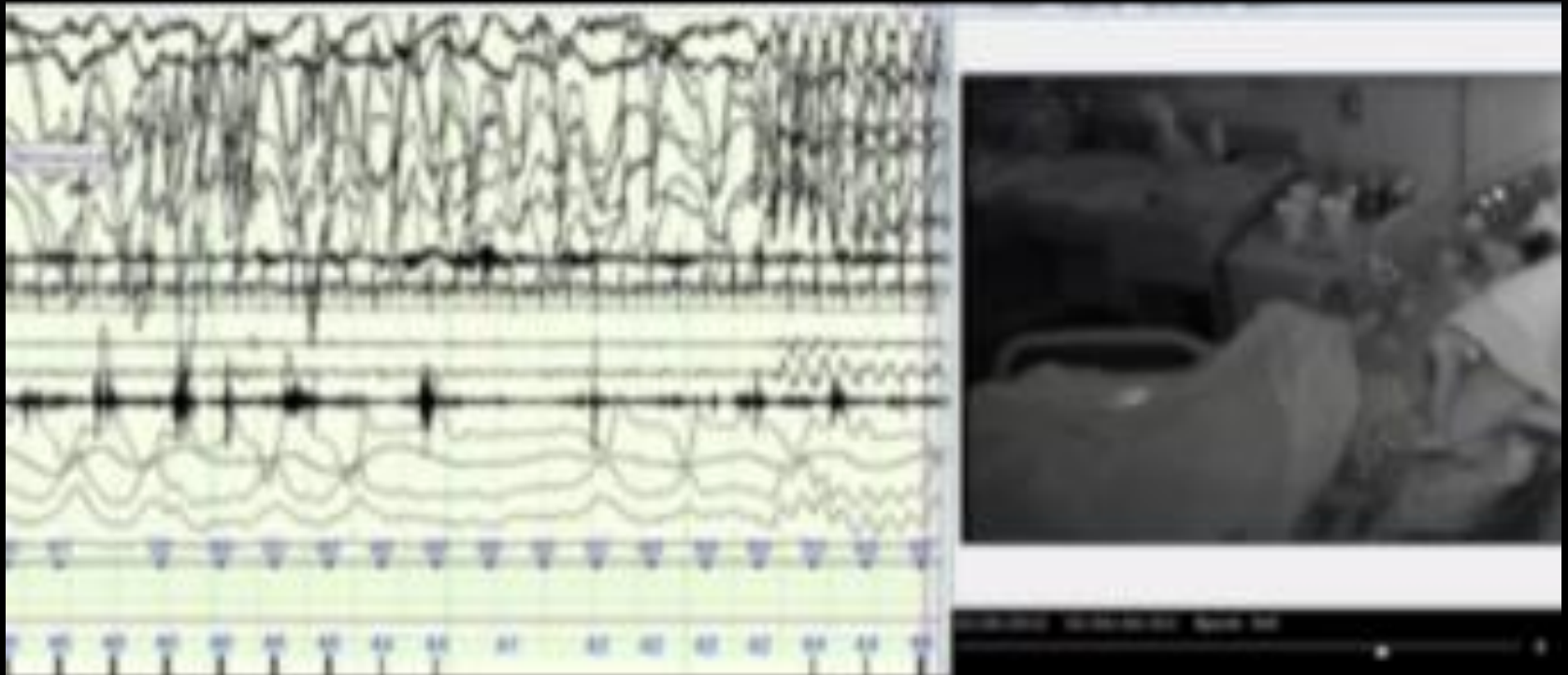


REM SLEEP BEHAVIOR DISORDER (RBD)

- Most movements are benign and involve the extremities
- RBD 4% have violent motor behaviors and/or complex vocalizations
- Prevalence in the general population is 0.3-0.5%
- Most affected group- Parkinson's



OSA WORSE DURING REM SLEEP





REM SLEEP BEHAVIOR DISORDER (RBD)

- Treatment
 - ✓ Rule out other sleep disorders
 - ✓ Change medications if behavior started after initiation
 - ✓ Melatonin
 - ✓ Clonazepam

CASE

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SLEEP-RELATED EPILEPTIC SEIZURES

NOCTURNAL FRONTAL LOBE SEIZURE

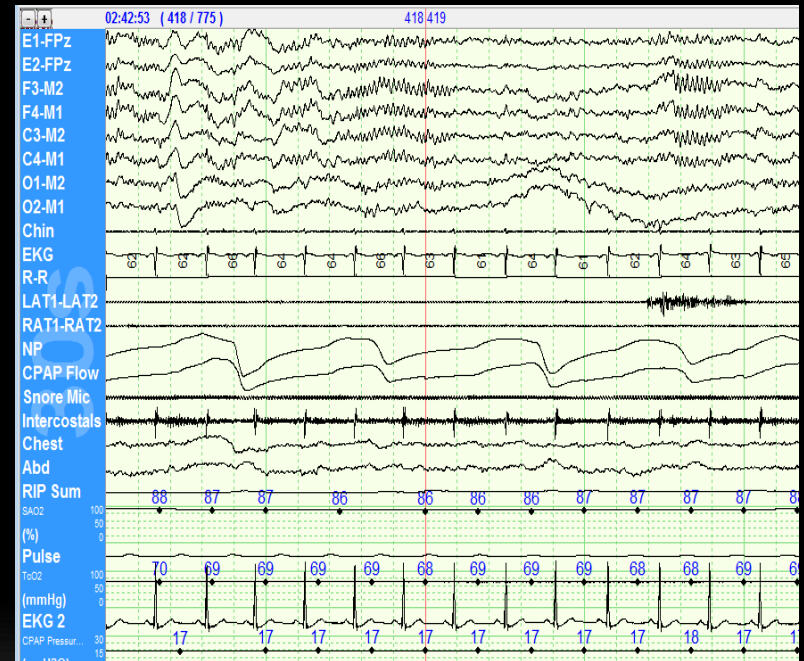
- Most common is nocturnal frontal lobe epilepsy (NFLE).
- Mean age of onset is 14 years old
- Diagnosis often made on clinical grounds
- NREM II sleep
- Patients often have multiple attacks at night
- 20% - positive family history
- Typical features:
 - Explosive onset of motor activity
 - Kicking
 - Running
 - Lasts 20-120 seconds
 - Patients often aware of seizure but cannot control their movements
 - No post-ictal amnesia
 - EEG often normal in > 50-80%



SLEEP-RELATED EPILEPTIC SEIZURES

NOCTURNAL FRONTAL LOBE SEIZURE

- NREM sleep and sleep deprivation are powerful activators seizures
- EEG “rhythmic” and synchronized during NREM sleep with sleep spindles, K complexes, and slow waves
- Nocturnal frontal lobe seizures are often misdiagnosed as sleep terrors, nightmares, or a psychiatric problem



SLEEP-RELATED EPILEPTIC SEIZURES

NOCTURNAL FRONTAL LOBE SEIZURES



SLEEP-RELATED EPILEPTIC SEIZURES

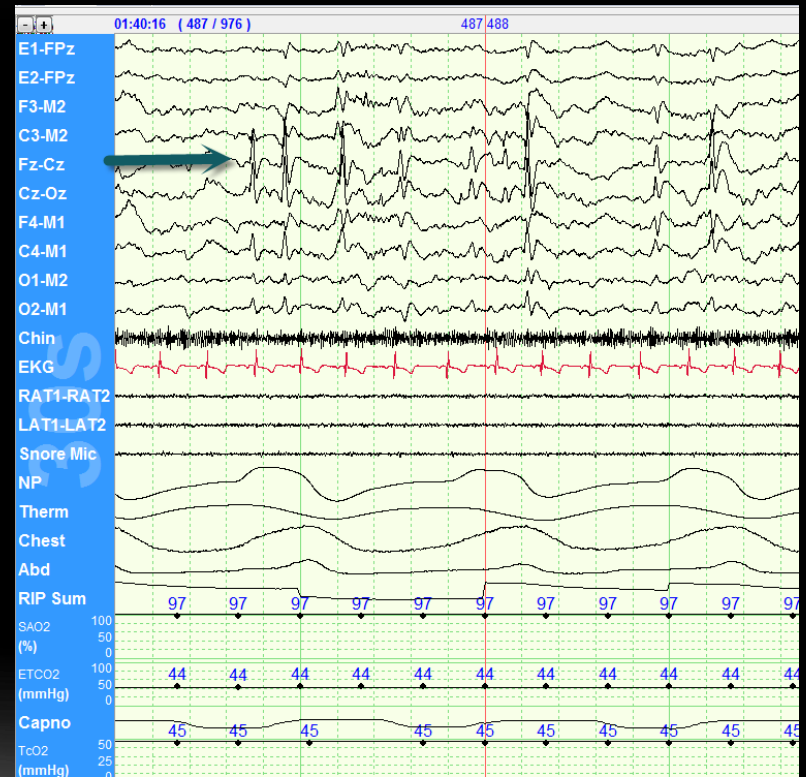
NOCTURNAL FRONTAL LOBE SEIZURES





BENIGN CHILDHOOD EPILEPSY WITH CENTRO TEMPORAL SPIKES (BENIGN ROLANDIC EPILEPSY)

- Most common sleep-related partial epilepsy syndrome in children
- 9% of all cases of epilepsy in children
- Mean age of onset is 8.8 years
- Seizures occurred primarily in sleep (88% of the time)



Miano, Epilepsy Behav 2013
Kim, Epilepsy Behav 2014



BENIGN CHILDHOOD EPILEPSY WITH CENTROTEMPORAL SPIKES AKA: BENIGN ROLANDIC EPILEPSY

- Arouse from NREM II
- Unilateral numbness or tingling of the cheek, tongue, or lips
- Grunting, drooling, unable to speak
- Jerking and pulling of the face to one side
- Consciousness is usually preserved





BENIGN CHILDHOOD EPILEPSY WITH CENTROTEMPORAL SPIKES (BENIGN ROLANDIC EPILEPSY)

- Seizures are worsened by
 - Sleep deprivation
 - Stress
 - Illness (fever)
 - Medications
- 15% have a single seizure
- 62% have 2-5 seizures
- 23% have more than 5 seizures
- 94% remission at 5 years

Conclusion:

Common contributors to
parasomnias:

Sleep deprivation

Stress

Illness (fever)

Medications

When there is a report of
abnormal behavior during
sleep, consider the presence
of a parasomnia

57TH ANNUAL FAMILY
MEDICINE SEMINAR
TAOS, NM

JULY 31 - AUGUST 3, 2014