Parasomnias: The Things That Go Bump in the Night

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1. I do not have any relationships with any entities **producing, marketing, re-selling, or distributing** health care goods or services consumed by, or used on, patients, OR

2. I have the following relationships with entities **producing, marketing, re-selling, or distributing** health care goods or services consumed by, or used on, patients.

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<tr>
<th>Type of Potential Conflict</th>
<th>Details of Potential Conflict</th>
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<tr>
<td>Grant/Research Support</td>
<td>Site Principal Investigator for multi-center clinical drug trial sponsored by JAZZ Pharmaceuticals - A Double-blind, Placebo-controlled, Randomized-withdrawal, Multi-center Study of the Efficacy and Safety of Xyrem with an Open-label Pharmacokinetic Evaluation and Safety Extension in Pediatric Subjects with Narcolepsy with Cataplexy</td>
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3. The material presented in this lecture has no relationship with any of these potential conflicts, OR

4. This talk presents material that is related to one or more of these potential conflicts, and the following objective references are provided as support for this lecture:
Goals

• Be able to describe the differences between nightmares and night terrors.
• Be able to describe factors which increase the propensity for primary disorders of arousal, including bedwetting, night terrors and sleep walking.
• Be able to discuss the indications for directed interventions for sleep walking.
• Be able to discuss treatment options for bedwetting.
Characteristics of Pediatric Sleep

- Amount and type of sleep required varies by age and activity
- Sleeping through the night
  - Vast majority will be by 4-6 months
- Naps
  - Age 6 mos.- begin to see change to 2 naps/day
  - Age 18 mos.- begin to see change to 1 nap/day
  - Age 3 yrs.-50.8% of children are still taking a nap, but not every day
  - Age 7 yrs.- Only 0.9% are still napping, if child is still napping at this age, consider primary sleep problem
AASM SLEEP DURATION RECOMMENDATIONS

- **INFANTS** (4-12 months): 12-16 hours recommended, 10-13 hours not recommended.
- **CHILDREN** (1-2 years): 11-14 hours recommended, 9-12 hours not recommended.
- **CHILDREN** (3-5 years): 10-13 hours recommended, 9-12 hours not recommended.
- **CHILDREN** (6-12 years): 9-12 hours recommended, 8-10 hours not recommended.
- **TEENAGERS** (13-18 years): 8-10 hours recommended, 6-10 hours not recommended.

**Recommended**

**Not Recommended**
Sleep Stages

- NREM Sleep
  - Divided into 3 stages of increasing deepness
- REM Sleep/Dream Sleep
- Cycle between NREM and REM sleep
Controls of Alertness and Sleepiness

• Sleep Debt
  – Amount of time since last sleep
  – Amount of sleep obtained

• Circadian Rhythm
  – Body’s internal clock
  – Controls the underlying rhythms of the body
    • Sleep
    • Hunger
  – Runs at a rate slower than 24 hours
    • $24\frac{1}{4}$ to 25 hours
Control of Alertness

WAKE/DAY

SLEEP/NIGHT

Circadian Control

Homeostatic Control
Importance of sleep

- Quality
- Quantity
Pediatric Sleep Disorders That Effect Sleep Quantity or Quality

- Obstructive Sleep Apnea
- Central Sleep Apnea
- GER-related Apnea
- Periodic Limb Movement Disorder
- Restless Leg Syndrome
- Narcolepsy
- Idiopathic Hypersomnolence

- Circadian Rhythm Disturbances
  - Delayed Sleep Phase
  - Advanced Sleep Phase
  - Non-24 Hour Rhythm

- Insomnia
  - Co-morbid
  - Psychophysiological
  - Anxiety
  - Idiopathic
  - Behavioral Insomnia of Childhood
    - Limit-Setting
    - Sleep Onset Association
  - Nocturnal Eating Syndrome
  - Environmental Insomnia
Primary Disorders of Arousal

- Types
  - Somnambulism
  - Night terrors
  - Confusional arousals
  - Bedwetting

- Occur during Stage N3 sleep
  (slow wave sleep or delta sleep)
  - Especially during brief awakenings that occur as children exit slow wave sleep

- Can incite occurrence in some children by causing an arousal at the correct time.
Primary Disorders of Arousal

• Last from 1-40 minutes (usu. 5-20 minutes)
• Seen most frequently in ages 6 mos. - teens
  – In that group, most common at 6 mos. to 6 yrs. old
• Often more intense in preadolescent and adolescent years
• Psychosocial contribution more prevalent in older children
• Family History common for all of them
Primary Disorders of Arousal
Primary Disorders of Arousal: Hypnogram
Wake EEG
Stage N3 Sleep
(Slow Wave Sleep/Delta Sleep)
Confusional Arousal
Confusional Arousal
Night Terrors
(pavor nocturnus)

- Considered normal maturational variant in children less than 6 years
  - Deepest Stage N3 sleep, hence more difficult to break the sleep stage completely
- Not clear if the arousal or the terror occurs first
- More intense/longer if try to arouse them out of it
- Act frightened during event, but DON’T seek comfort
- No recollection after the event
Treatment of Night Terrors in Younger Children

- Ensure adequate total sleep
  - Tiredness increases drive for deeper delta sleep
- Routine
  - Helps establish biological rhythm, including sleep-wake, and sleep state transition
- Don’t try to awaken them
- Don’t question them about the episode
- If identifiable stressor is present, deal with it
Treatment of Night Terrors in Older Children (>6 years)

• Psychological stressors usually much more relevant
  – Especially in well-behaved children (internalization)
  – Anxiety increases arousability and susceptibility to primary disorders of arousal
  – Less drive to delta sleep

• Frequency is relevant
  – Single or rare episode is probably normal and caused by illness, sleep deprivation, etc.

• Even “mild” identifiable stressors may be relevant, so older children with frequent occurrences should undergo psychosocial assessment and therapy if stressors present
Sleepwalking (Somnambulism)

- 15-25% of children will have at least one episode
- Strongly tied to FH
  - One parent, incidence increases to 45%
  - Two parents, incidence increases to 60%
  - Twin studies, incidence increases to 65%
- Injurious behavior with sleep-walking may be more common with late-onset (after 16 yrs. old)
Sleepwalking (Somnambulism)

• Treatment considerations:
  – Make sure the environment is safe
    • Alarms on doors/windows
  – Try to lead them back to bed without awakening them, or just watch them
  – If need to awaken them for their own safety, do so as calmly as possible, WITHOUT restraining them in any way
  – Precautions in situations where episodes are more likely to occur
    • Camp, sleep-overs, vacation
Sleepwalking
(Somnambulism)

• Consider Medications in RARE cases, when there are concerns about patient safety
  – Benzodiazepine (clonazepam) is usually first-line treatment
  – Ambien, TCAs could be considered
  – Decrease nocturnal arousals
Differential Diagnosis for Confusional Arousals

- REM Behavior Disorder
- Sleep-Related Epilepsy
  - Benign Epilepsy with Centro-Temporal Spikes
  - Nocturnal Frontal Lobe Epilepsy
- Intoxication/Ingestion
Table 2—Important Quantitative and Qualitative Features which can be Used in the Positive Identification of Parasomnias

**Features strongly favoring parasomnias**
- Yawning
- Scratching and prominent nose-rubbing
- Rolling over in bed
- Internal or external trigger (noise, cough, snore)
- Waxing and waning pattern
- Physical or verbal interaction
- Sobbing, sad emotional behavior
- Indistinct offset
- Failure to fully arouse after event with complex behavior
- Prolonged duration (> 2 minutes)
- Discordance between severity and duration of reported event and recorded event

**Features moderately favoring parasomnias**
- Tremor/ trembling
- Myoclonic jerks
- Coughing
- Semipurposeful behaviors, fumbling, manipulation of nearby objects
- Variability/ absence of stereotypy
- No events recorded on first night of monitoring
- Few events recorded in total (less than 3)

**Features which do not discriminate between parasomnias and NFLE**
- Brevity
- Sitting
- Standing or walking*
- Preceding “normal” arousal
- Brief arousals (up to 10 seconds) without definite semiological features of epilepsy
- Fearful emotional behavior

*Standing and walking do not, in usual circumstances, discriminate between parasomnias and NFLE. However, in individuals who rouse to full wakefulness after their events, and in whom events have an indistinct offset, standing or walking suggests a diagnosis of parasomnias over NFLE (see decision tree algorithm).

REM Behavior Disorder

- Adult diagnosis, exceedingly rare in children (usually males older than 50 yrs.)
- Occur in REM sleep
- Appear to act out dreams, with recall
  - Differentiate from implanted recall
- Injurious behavior to patient or bed partner common presenting feature
- Associated with Parkinson, Multiple System Atrophy, and Lewy Body Dementia
Bedwetting (sleep enuresis)

- Related to partial arousals (less likely during REM)
- Incidence
  - Majority of children are dry by age 4
  - 15% at age 5
  - 5% at age 10
  - 1-2% in adolescence
- Strongly tied to FH
  - One parent, at age 5 incidence increases to 45%
  - Two parents, at age 5 incidence increases to 75%
- 60%+ male, varies with age
- 15% spontaneous resolution per year
KEY POINT: In most cases the child feels worse about it than parent or provider

- NO PUNATIVE TREATMENT
- Children respond better to positive than negative reinforcement

• Reinforcement/Responsibility Training
  - Increase daytime and nighttime responsibility
  - Reward dry night (star chart)

• Fluid Restriction
  - Limit fluids after 6pm
Treatment of Sleep Enuresis

• Bladder Training
  – Increase interval between voids during day
    • Minimum of 3-4 hours between voids
  – Hold for as long as possible at least 1 time/day
    • Goal is 50% improvement in volume or greater than 10 oz.
  – Practice starting and stopping stream
  – Once successful, over-learn (increase fluid volume)

• Lifting
  – Wake child and have child go to bathroom when caregiver goes to bed
  – Can be beneficial on night used, but does not effect long-term course
  – May increase tiredness (caregiver and patient)
Treatment of Sleep Enuresis

Desmopressin

Cost
$27.00-$88.80 per month

Side Effects
Nausea, vomiting, weakness, loss of appetite, headaches, feeling restless or irritability, confusion, hallucinations, muscle pain or weakness and/or seizure

Efficacy
15% cure rate at 1 year

Bedwetting Alarm

Cost
$37.50 one time

Side Effects
Waking up

Efficacy
90% cure rate at 6 months

1www.pharmacychecker.com (5/3/17)
Treatment of Sleep Enuresis

• Conditioning (Alarms)
  – Child must wake up with alarm
  – Must change his own sheets or perform some other purposeful activity
  – Success: 1mos = 25%, 3mos = 50%, 6mos = 90%
  – Use 21-28 days after last wet night

• Medications
  – DDAVP first line
    • imipramine is now considered second line therapy
  – Band-Aid: best used for special occasions or situations
  – Lifting is an alternative in some children for special occasions
Nightmares

• Occur in REM sleep
  – Usually in later parts of the night

• By definition, followed by a full awakening
  – Otherwise wouldn’t know that they had occurred

Clown: https://www.pinest.com/astridlakjer/det-sejeste-kommunikations-kj-team/
Nightmares: Hypnogram
Nightmares

• Two Incidence Peaks:
  – Early Childhood
    • Adaptation Skills not = Cognition
    • < 2 years old, difficult to separate dream from reality
  – Adolescence
    • Increased stressors

• Reflect emotional/intellectual conflicts that occur during the day

• Children ARE scared when they occur
  – Need comfort and reassurance (age appropriate)

• Specific considerations for PTSD and depression
Nightmares

Interventions:
• Relaxation/meditation
• Imagery Rehearsal Therapy → Lucid Dreaming
  – Cognitive restructuring
  – Changes the narrative of the dream
• Exposure
  – Written down and relieved following day
  – Usually done with mental health provider
• If frequent and persistent, counseling to address underlying emotional conflicts may be necessary
• Use of medications
  – In conjunction with mental health provider and counseling
  – Prazosin (specifically in PTSD), anti-depressants
Nightmare or Night Terror?

- **Nightmare**
  - Aware of event
  - Awaken afraid and fully alert
  - Seek Comfort
  - REM Sleep
    - Usually later in the night

- **Night Terror**
  - Unaware of event
  - Awaken calm and cobwebby
  - Push support away
  - Stage N3 Sleep/Arousal
    - Usually in first 2 hours
Rocking, Rolling, and Head Banging

- Called Rhythmic Movement Disorder (behavior)
- Rhythmic movements that occur predominately when drowsy and when initiating sleep
- 20% of young children do any form of it
- 5% of young children head bang
- Boys 3:1 more likely than girls to head bang
- Usually begins by age 1 year and ends by age 3 years
- Length of time varies, 1 hour is not unusual
- Serious head injury (CHI, skull fx) does not occur
  - May be associated with bruising
- Occurs more frequently in children with autism, but majority of children who do it are developmentally normal
Intervening in Rocking, Head Rolling, and Head Banging

• No intervention necessary
  – Exception is developmentally inappropriate children
    • Can be prone to self-injury with this behavior
• Don’t reinforce
• Avoid being over-tired
• Loud metronome or clock
  – Set at beat slower and non-synchronized to intrinsic rocking rate
  – Can consider music at slower rate, but has additional issues on sleep quality
• Older children
  – More often associated with anxiety and attention seeking
  – Consider counseling for any underlying emotional problems
Sleep talking (nighttime soliloquy)

- Benign, nearly ubiquitous behavior
- How benign?
  - Struck By Turtle (W59.22XA)
  - Pecked by chicken, initial encounter (W61.33XA)
  - Burn due to water-skis on fire, initial encounter (V91.07XA)
  - Problems in relationship with in-laws (Z63.1)
  - No specific code for sleep talking despite its frequency
Questions?