Taking Control of Narcolepsy and Idiopathic Hypersomnia

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Disclosures

- I have no conflicts of interest to disclose.
- I receive no funding through pharmaceuticals.
- I am employed by LMHS.
- I am author and have a website that provides sleep health information.
Objectives

At conclusion of this lecture the participants will:

- Review classical symptoms of Narcolepsy/IH.
- Understand non-classical symptoms of Narcolepsy.
- Be able to better explain symptoms of Narcolepsy to patients and families.
- Be able to educate factors outside of Narcolepsy/IH that can influence sleepiness and alertness.
WHAT IS NARCOLEPSY?

THIS ISN'T....

THIS IS!
Narcolepsy Symptoms

- **Sleepiness**
  - Sleepiness is usually the first symptom

- **Cataplexy:**
  - Sudden episodes of muscle weakness (50%)

- **REM sleep–like phenomena**
  - Sleep paralysis
  - Hypnagogic/Hypnopompic hallucinations

- **Fragmented sleep** (50%)
Evaluation

- **PSG (Polysomnogram)**
  - Verify > 6 hours of sleep prior to MSLT
  - May see fragmented sleep or short REM latency

- **MSLT (Multiple Sleep Latency Test)**
  - Mean sleep latency 8–10 minutes
  - 2 SOREMPs (Sudden Onset REM Periods)

- **HLA DBQ1*0602**
  - 90% of Narcolepsy with cataplexy
  - 25–35% of General population

- **CSF (Cerebral Spinal Fluid) Hypocretin–1**
  - < 110 pg/mL
Key Point:
What is Normal Wake and Sleep Drive?
Sleep Wake Drive

Sleep Wake Cycle: Two Process Model

Homeostatic Sleep Drive

Circadian Alerting Signal (SCN)

Melatonin

9 am 3 pm 9 pm 3 am 9 am

Awake Asleep

Normal Sleep

Diagram showing the stages of sleep over a period of 8 hours, with labels for Awake, REM, Stage 1, Stage 2, Stage 3, and Stage 4.
MSLT (Multiple Sleep Latency Test)

- Patient given 20 minutes to take a 20 minute nap
- Mean Sleep Latency
  - No sleep – Normal
  - 16 to 20 minutes – Normal
  - 11 to 15 minutes – Mild sleepiness
  - 6 to 10 minutes – Moderate sleepiness
  - 0 to 5 minutes – Severe sleepiness
MSLT (Multiple Sleep Latency Test)

SOREMPs
(Sudden Onset REM Periods)

Narcolepsy diagnosis by MSLT
• Mean sleep latency of 8 minutes
• 2 SOREMPs
Narcolepsy

- Lifelong neurologic/sleep disorder characterized by the disruption of the boundaries between sleep and wake states

- Classic pentad of signs and symptoms:
  - Excessive Daytime Sleepiness (EDS)
  - Cataplexy
  - Hypnogogic hallucinations
  - Sleep paralysis
  - Disrupted nighttime sleep (DNS) [nocturnal sleep fragmentation]

  Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.
Narcolepsy Symptoms

- Gothic description of sleep paralysis. And symptoms of Narcolepsy have been misdiagnosed as Psychiatric.
- An incubus (from the Latin verb, incubo, incubare, or "to lie upon") is a demon in male form who, according to a number of mythological and legendary traditions, lies upon sleepers.
Cataplexy

- Episodic weakness without altered consciousness lasting seconds to minutes and precipitated by excitement or emotion
- May occur several times/day or a few times/year
- Sagging of face, eyelid, or jaw; dysarthria (slurred speech—particularly in children); head drop; blurred vision; knee bucking; “drop attack”
- Episodic blurring of vision
- Laughter is the most common trigger
- Usually develops within 3 years of EDS symptoms, but may develop 10–40 years later
  - Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.
Sleep Paralysis

- The inability to move for a few seconds or minutes during sleep onset or offset
- Often occurs in normal individuals on a relatively rare episodic basis but is far more common and almost universal in narcoleptics
- Paralysis ends spontaneously (fear reaction is most common) or after mild sensory/tactile stimulation

*Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.*
Hypnagogic Hallucinations

- Vivid, “waking dreams” that occur during transitions between sleep and wakefulness
  - Hypnogogic (occurring at sleep onset)
  - Hypnopompic (occurring upon awakening)
- May accompany sleep paralysis or occur independently
- May be tactile or auditory
- Some awareness of surroundings is preserved
- Differentiated from dreaming during sleep

- Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.
Disrupted Nocturnal Sleep (DNS)

- Common aspect of narcolepsy that differs from DNS in other sleep disorders including insomnia
- Patients report:
  - Frequent arousals
  - Higher wakefulness after sleep onset (WASO)
  - Frequent shifts to wake or increased N1 sleep with reduction in N3 (SWS)
  - Decreased in overall sleep efficiency (SE)
  - Typically there is no prolongation of a return to sleep
- Several studies using PSG suggest that the decreased NREM and slow wave activity are possible mediators of the fragmented sleep
Other Symptoms

- Ancillary symptoms:
  - Automatic behavior
  - Loss of concentration and memory (“Narcofog”)
  - Visual symptoms (blurred vision) [cataplexy of eye muscles]

  - Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.
Lucid Dreaming

Nightmares are a frequent symptom in narcolepsy.

Lucid dreaming, i.e., the phenomenon of becoming aware of the dreaming state during dreaming, has been demonstrated to be of therapeutic value for recurrent nightmares.

Narcolepsy patients experience a markedly higher lucid dreaming frequency compared to controls, and many patients report a positive impact of dream lucidity on the distress experienced from nightmares.

Demographics

- Prevalence 1:2,000 in U.S.
- Male = Female
- Mean age of onset is 15–20 years of age
Onset between ages 15 and 30 in 60% of patients
Age range from 5 to 63
Median age of 22
Onset of cataplexy ages 9 to 68
Hypnagogic hallucinations ages 9 to 65
Sleep Paralysis ages 10 to 58

Only 50,000 of the estimated 200,000 Americans with narcolepsy have been correctly diagnosed

Almost as common as Multiple Sclerosis

Can go 10 to 15 years after symptoms start before correct diagnosis is made

A patient with narcolepsy/cataplexy sees an average of 5–7 physicians before a proper diagnosis is made

What if There are no SOREMPS?

- Idiopathic Hypersomnia
  - Mean sleep latency 6.2 minutes ± 3 Minutes (3.2–9.2)
    - With Long Sleep Time
      - > 10 hours of sleep per night
      - May sleep 12–14 hours!
    - Without Long Sleep Time
  - Onset is 10–30 years of age
    - 25% Resolution
  - CSF Hypocretin normal
  - CSF Histamine decreased
Mimickers of Hpyersomnia

- Chronic Fatigue Syndrome / Fibromyalgia
  - May show Alpha–Delta sleep
- Medical causes of fatigue.
- Psychiatric
  - Chronic feelings of sleepiness
  - May spend full day in bed
  - **MSLT usually normal.**
  - PSG – long sleep latency / reduced sleep efficiency.
Common Misdiagnosis

- Commonly mistaken for:
  - Daydreaming
  - Insomnia
  - Drug Abuse
  - Depression/Bipolar disorder
  - Apathy
  - ADD
  - Seizures

- Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.
Comorbid

- Can coexist with other sleep disorders
  - Obstructive Sleep Apnea
  - Insomnia
  - Restless Legs Syndrome
  - Periodic Limb Movements in Sleep
  - REM sleep behavior disorder
  - Nocturnal eating disorder
Low Hypocretin/Orexin in Narcolepsy

Control (n=47)  Narcolepsy with Cataplexy (n=101)  Narcolepsy without Cataplexy (n=20)

Mignot et al. 2002
Human narcolepsy/cataplexy is caused by loss of hypocretin (orexin) neurons in the dorsolateral hypothalamus (70,000 neurons in a paired set)

Thought to be caused by an autoimmune process directed specifically against hypocretin neurons in the hypothalamus (not by a mutated gene)

- The canine form (e.g., Doberman Pinchers) of narcolepsy is caused by a single mutated hypocretin receptor 2 gene in an autosomal recessive pattern
  
Biochemistry of Cataplexy

Diagram showing neural pathways involving cortex, TMN, SN, VTA, PPT, LDT, thalamus, Raphe, LC, Medial Medulla, and Motor neurons. The diagram includes labels for GABA, Glycine, and mPRF. The pathway also involves cholinergic REM-on and inhibition pathways.
Cataplexy

Cataplexy is no laughing matter

KEY
Type of Stimulus
- Excitatory
- Inhibitory
- Loss of normal excitatory function

Neurotransmitter Used
- Unknown
- Hypocretin/Orexin
- Norepinephrine
- Acetylcholine
- Glutamate
- Glycine
- GABA (gamma amino butyric acid)

CROSS SECTION OF SPINAL CORD
MOTOR NEURON
MUSCLE
HYPOTHALAMUS
AMYGDALA
LOCUS COERULEUS
MEDULLA
Laughter is # Trigger

Laughter: 90
Joking: 80
Anger: 70
Excitement: 60
Surprise: 50
Happy Memory: 40
Embarrassment: 30
Treatments

1. Nonpharmacologic
   - Avoid sedating medications, heavy meals
   - Scheduled naps
2. Treatment of Sleepiness
   - Stimulants
   - Non-stimulants
3. Treatment of Cataplexy
   - Xyrem (Sodium Oxybate)
   - REM suppressants
Behavioral Treatment

- **Naps**
  - 20 min naps 2 or 3 per day (when possible)
  - Avoid driving when sleepy
  - Avoid high carbohydrate foods
- **Maintain good sleep hygiene (try NOT to deviate from routine sleep/wake schedules)**
- **Psychosocial support**
  - Family • School • Job
- **Education**
  - Narcolepsy Network • Wake Up Narcolepsy • National Sleep Foundation
- **Cataplexy**
  - Avoid emotional situations likely to induce cataplexy
    - Dr. Todd Swick: Keynote Address, Narcolepsy 101. Narcolepsy Network Annual Conference 2014 Denver, CO.
Emotions

- Laughter: 90
- Joking: 80
- Anger: 70
- Excitement: 60
- Surprise: 50
- Happy Memory: 40
- Embarrassment: 30
Emotions

- Emotions commonly bring symptoms of REM intrusion to a person with Narcolepsy.
- It is NOT a simple “mind over matter”.
- It is biological and due to less Hypocretin/Orexin levels.
- However all people may benefit from emotional regulation.
- Emotions do influence our biology in many ways.
In Control:

- Counseling on emotional regulation.
- Finding a mentor in Mindfulness may also be helpful.
- Breathing... calming the heart calms the mind
Monitoring

- Have you ever had a bad night’s sleep but still got through the day?
- Have you ever had great sleep and still felt tired the next day?
- When you get a Band-Aid taken off as a child do you instruct the child to stare at it, or to look away and distract them?
- PWN and IH can’t control that they have a disease with objective sleepiness, once again it is not mind over matter.
- However if anyone monitors for signs of fatigue, they will eventually find the sensations of tense shoulders, heavy eyes, and mental fog.
Monitoring

In Control:

- Regular practice with Mindfulness, Yoga, or any other type of meditative practice.
Predictable causes of EDS

- Acute Stress
- Shift Work / Jet Lag
- Chronic Insomnia
- Stress
Sleep Wake Drive

Sleep Wake Cycle: Two Process Model

Homeostatic Sleep Drive

Circadian Alerting Signal (SCN)

Melatonin

Awake Asleep

9 am 3 pm 9 pm 3 am 9 am

Company – Mirror Neurons

- When a person walks into a party with people smiling, they feel happy.
- When one walks into a principal’s office and there’s a boy with the look of dread staring at the floor, one may feel anxious.
- One can’t control their Hypocretin/Orexin levels, but we do have control of the company we keep.
- Friends of mine with Narcolepsy tell me that she feels more upbeat when they are around people that are motivated and energized, and likewise they feel more drained when they are around negativity.
- There is a neurobiology to this as well, and it is called mirror neurons.
- This is how a baby will stick its tongue out when you do.
- Through mirror neurons a smaller child may imitate the kicking that an older sibling does in a karate class, and equally it’s why an older sibling with a well formed vocabulary engages in the baby talk of its younger sibling.
In Control:

- There are moments that it is okay to disconnect with people that infuse negativity.
Smile

- Stand in front of the mirror and smile for 10 seconds.
  - Did that make you feel happy?
- Now do the opposite, stand in front of the mirror and frown.
  - Does that give you a sensation in your gut that is not pleasant?
- There is a neurobiology to this as well. The nerves of our muscles of facial expression come from our brainstem. The brainstem also has connections to our limbic system which is our emotional area. The brainstem actually has other nerves that communicate with the emotional limbic area that then go back to our body including our heart and gut.
- In feelings of happiness we are contracting muscles that raise the cheek in combination which pulls up the corners of the lips. This also sends input to our emotional area and to our body as well as it gives a “heartfelt” feeling.
- And when we frown we indeed feel sad. When inner parts of his eyebrows shoot up you may feel distress and anguish. Narrowing of the red margin of the the lips is a reliable anger sign. This is also communicate with nerves that go down to our body and give us a “gut feeling” that something is wrong.
- Once again, this is also where mirror neurons will make us feel what others our feeling.
  - The emotion of anguish can be exhausting!
In Control:

- Take the time to smile whenever you come across a mirror.
- Notice when you feel sad, attempt to find something that brings you a happy thought and smile.
- Tell a child you like their smile, it will build confidence in their smile. When they are confident in their smile, they will smile more. When you smile more, you will feel better.
Posture

- It is commonly observed in many people, when they slouch they get tired.
- There is a reason a teacher will tell one to sit up straight, the spinal muscles send messages to stimulate nerves in the Reticular Activating System (wake/alertness promoting area of the brain).
Posture

In Control:

- Taking moments to regularly sit up straight.
- Exercising one’s core muscles to promote good posture.
- Comfortable chairs that promote good posture.
An observation that I have made is that when people practice Mindfulness and other types of meditation, they get sleepy.

This has been universally observed to the point where techniques have been cultivated to be wake promoting to help keep one from falling asleep.

Posture is one as discussed above.

Another is the visualization of white light, such techniques allow Buddhist monks to stay alert for very long durations of meditation.

Also, Mindfulness can be practiced to improve attention span and decrease anxieties.
In Control:

- Finding a studio or a mentor that can help one build meditation skills.
Have you ever woken up at night because you had to use the bathroom?

So being well hydrated is alerting!

Have you ever felt fatigued after excessive sweat or on a go–go–go day that you didn’t have time to drink any water?

People commonly ask how much water one needs to drink per day.

My answer is to look at your urine. If it is yellow you are slightly dehydrated, and if it is clear like water you are well hydrated.
Hydration

In Control:
- Staying well hydrated.
- I commonly write a letter allowing for a student to be allowed to carry water with them at school, as well as allowing for frequent bathroom breaks.
Food

Ghrelin

Leptin
Food

- Ghrelin is a hormone that gives one a sensation of hunger, and it also equally causes alertness.
- When the stomach is empty, gastric cells secrete ghrelin.
- Once the stomach is distended, it stops secreting ghreling.
- Heavy meals have the opposite effect, they are sleep inducing.
- Blood sugar fluctuations cause adipocytes (fat cells) to secrete leptin.
- Leptin gives feeling of satiety, and sleepiness.
- Leptin is secreted in proportion to the amount of fat cells one has.
- High levels of leptin have been associated with sleepiness.
Food

In Control:

- Avoiding heavy sedating meals.
- Regular exercise decreases body fat which also decreases leptin levels.
Diet Therapy and Narcolepsy

- Dietary modifications have been found to be effective in improving symptoms of Narcolepsy with low-carbohydrate, ketogenic diet (LCKD). Patients with diet therapy for narcolepsy experienced modest improvements on Narcolepsy Symptoms Status Questionnaire (NSSQ).
  

- Dietary modifications have been found to be effective in improving symptoms of mood disorders. The anti-depressant properties of the ketogenic diet.
  
Peppermint oil has been studied to improve alertness and memory.

L–Tyrosine

- L–Tyrosine is an amino acid that is used to produce NE (norepinephrine) and DA (dopamine).
- A randomized, double-blind, placebo-controlled study of L–tyrosine was done in ten subjects with narcolepsy and cataplexy.
- Of twenty-eight visual analogue scales rating mood and arousal, the subjects' ratings in the tyrosine treatment (9 g daily) and placebo periods differed significantly for only three (less tired, less drowsy, more alert).
- Dietary supplementation with tyrosine 9 g daily for 4 weeks seems to have a mild stimulant action on the central nervous system but this effect is not clinically significant in the treatment of the narcoleptic syndrome.
L-Tyrosine and Sleep Deprivation

- Taking tyrosine orally seems to improve alertness following sleep deprivation.
- Tyrosine 150 mg/kg seems to delay performance decline in psychomotor tests by about 3 hours after loss of a night's sleep.
- Other preliminary clinical evidence suggests that taking tyrosine 150 mg/kg prior to cognitive testing improves memory, reasoning, and vigilance compared to placebo in sleep-deprived patients.
Treatments
Narcolepsy Medication Management

- Cataplexy
  - Venlaxafine
  - Fluoxetine
  - Clomipramine
  - Protriptyline
  - Selegiline

- Sodium Oxybate*

- Daytime Sleepiness
  - Methylphenidate
  - Dextroamphetamine
  - Methamphetamine
  - Selegiline
  - Modafinil*
  - Armodafinil*
  - Napping

* = FDA Approved
Biochemistry of Sleep/Wake

Wakefulness Neurotransmitters:
Narcolepsy Medication Management

- Treatment of excessive daytime sleepiness (EDS)
  - Stimulants (methylphenidate, amphetamines)
  - modafinil (Provigil®)–racemic mixture of “r” and “s” forms of modafinil
  - armodafinil (Nuvigil®)–pure “r” isomer of modafinil
- Treatment of Cataplexy
  - Tricyclic antidepressants (TCAs)
  - Selective Serotonin Reuptake Inhibitors (SSRIs)
  - Selective Serotonin Noradrenergic Reuptake Inhibitors (SSNRIIs)
- Both EDS and Cataplexy
  - Sodium Oxybate (Xyrem®)
Benefit of Treatment

- “Wake Up Narcolepsy” survey of patients [2013–2014] (n= 2017; data were analyzed of 1697 respondents along with information from their direct care givers)
  - 62% were between the ages of 25–54
  - 78% had narcolepsy symptoms for >3 years (prior to diagnosis)
  - 59% had cataplexy
- “Improved” EDS with FDA approved medications: 85.4% •
  - 42.3% had improved cognition
  - 51.8% improved fatigue
- Despite treatment most patients continue to struggle with daily symptoms
  - Residual EDS symptoms in 64.8%
  - Constant fatigue 37.4%
  - Cognitive impairment 40.8%
- Cognitive symptoms are very common and are under-appreciated by clinicians
  - Efficacy of current narcolepsy treatments: are we setting the bar too low? Maski KP et al. Sleep 37: A232; 2014 (abs)
Alerting Medications

- Generally medications that are wake/alertness promoting increase levels Dopamine and/or Norepinephrine.
- These medications may last for different durations in different people.
Alerting Medications

In Control:

- Choice of whether one takes medications or not.
- Taking a long acting medication if we need to get through the day.
- Taking a short acting medication either as needed, or when one feels a long acting medication wearing off.
- Avoidance of sedating medications is also advised.
Patients with Narcolepsy have less Hypocretin/Orexin which causes intrusions of REM sleep into the daytime giving symptoms of cataplexy, vivid dream like hallucinations, and sleep paralysis.

These are commonly triggered by emotions. Antidepressants commonly suppress REM, which is why they can reduce these symptoms.

Sodium Oxybate is a medication that consolidates sleep at night, and with better sleep consolidation there are less daytime REM intrusion symptoms.
REM Dysregulation

In Control:

- Choice of whether to take REM suppressing medication, and avoidance of such medications that cause sleepiness in daytime.
Increased Sleepiness can occur with

- Ethanol
- Anti-Histamine (H1)
- Tricyclics
  - Except Vivactil (protriptyline)
- Antipsychotics
- Benzodiazepine
- Lithium
- Dopamine agonists
- Beta-blockers
- AED (Antiepileptic drugs)
Adenosine

- Anything that gives energy also gives a waste product.
- Gasoline gives your car energy, and the waste product of exhaust comes out the muffler.
- Our brain uses glucose for energy, and the waste product is Adenosine which makes one the feeling of “exhaust”. In the first half of one’s sleep, the deep slow wave sleep washes away the Adenosine/exhaust.
- Having inadequate sleep at night may result in feeling exhausted in morning.
- Also, Caffeine counteracts Adenosine/exhaust in one’s brain.
Adenosine

In Control:

- Scheduling naps allow for an early portion to help reduce some Adenosine/exhaust build up.
- Caffeine consumption can allow to help lower levels of Adenosine/exhaust.
- Setting regular bed times to allow for sufficient sleep.
Caffeine

- It is my general experience that patients with hypersomnia have and will use caffeine for symptoms of Excessive Daytime Sleepiness.
- Consider providing caffeine content of FDA approved formulations as a point of reference.
- Advise not to exceed the FDA studied dose at 200 mg every 3–4 hours.
- Advise against caffeine in afternoon as it may cause insomnia, though I have advised that a dose of a caffeinated beverage immediately after lunch may help in staying alert during a physiological tendency towards sleepiness.
- Advise to look at serving size of all caffeinated beverage preparations in order to not exceed doses beyond FDA approved safety dosages.
- Advise that if a patient is to use caffeine, that they choose a particular formulation that they have found to be effective and tolerated and that they consistently use that particular preparation.
Caffeine

FDA Approved Caffeine Preparations:
- NoDoz, Vivarin – 1 tablet contains 200mg of caffeine – Q 3–4 hrs; Max 8 tabs in 24 hrs
- Excedrin Migraine (Acetaminophen, ASA, Caffeine) – 1 tab 65 mg of caffeine
- FDA official limit for cola or pepper soft drink – 12 oz – 71 mg (range 35–72mg)

Other Caffeine:
- Coffee – (8 oz) Generic Brewed – range 102–200 mg
- Coffee – (8 oz) Generic Decaf – range 3–12 mg
- Starbucks Brewed Coffee – (16 oz) Grande – 320 mg
- Tea – (8 oz) Generic Brewed – range 40–120 mg
- Red Bull – (8.3 oz) – 80 mg
- Monster – (16 oz) – 160 mg
- 5–Hour Energy – (2 oz) – 138 mg
- Caution: Spike Shooter – (8.3 oz) – 300 mg
- Always check serving size!
- Hershey Chocolate bar (1.5 oz) or Hot Cocoa (8 oz) 3–13 mg (However sugar content induces sleepiness).
Nicotine

1. Effects of nicotine on sleep during consumption, withdrawal and replacement therapy. "most studies indicated a nicotine induced rapid eye movement (REM) sleep suppression"

2. A Novel Approach to Treating Morning Sleep Inertia in Narcolepsy. "We describe an adolescent with narcolepsy who presented with inability to awaken from sleep to attend early morning classes at school. After he did not respond to traditional therapies, a nicotine patch was prescribed with success. We present our experience with this unconventional treatment, which may benefit others with inability to awaken from sleep that is refractory to standard treatments."
Sleep Disorders

- An estimated 50% of patients with Narcolepsy have insomnia.
- An estimated 25–50% of patients with Narcolepsy can have sleep apnea.
- Large portions of the general population can have these disorders, as well as other disorders (ex: Restless Legs Syndrome).
Sleep Disorders

In Control:

- Evaluation for identification and treatment of other sleep disorders that may further contribute to sleepiness.
To Whom it May Concern,

@NAME@ DOB: @DateOfBirth@ is under our care for:

1. Narcolepsy (347.00)

Pediatric Narcolepsy, the ICSD (International Classification of Sleep Disorders) states: The daytime sleepiness of narcolepsy may present as sleeping at school or the reappearance of regular daytime naps. Narcolepsy in children can also manifest as behavioral problems, decreased performance, inattentiveness, lack of energy, or insomnia. Affected children may be misdiagnosed with attention-deficit/hyperactivity disorder, schizophrenia, or depression. Episodes of cataplexy may be misdiagnosed as seizures. The presence of sleep paralysis or hypnagogic hallucinations may be difficult to confirm, depending on the child’s verbal ability. Narcolepsy with cataplexy is extremely rare prior to the age of four years.

Non-Pharmacologic approaches in hypersomnia management include avoid sedating meals, avoid sedating medications, do not drive when tired, avoiding dehydration, etc...
Caffeine use with moderation is a non-prescription approach. Advised against Large size over-caffeinated (Monster), however a small can of Diet Red Bull (avoid sugar crash) or sips of other caffeinated beverages were discussed. Can content must be one serving size and has to have written approval by @FNAME@'s parent/guardian. Frequency is up to every 4 hours.

@FNAME@ needs to be allowed to carry water at school to stay hydrated, as dehydration can cause sleepiness. @FNAME@ needs to be allowed to have a caffeinated beverage, specifically with approval of @FNAME@'s parent/guardian. With this, it is also necessary that @FNAME@ be allowed to take bathroom breaks in day time.

@FNAME@ should be allowed to take a 20–40 minute nap, not to exceed 3 times in one week. If @FNAME@ realizes a sleep attack may come, @FNAME@ should be allowed to take such a 20–40 nap at the school nurses office.

Extended time is required for testing. @FNAME@ should be allowed time-and-half to complete test. Or, if extended time is not provided, @FNAME@ must be allowed to take a 20–40 nap and/or bathroom break, and resume with the standard time minus the break.

The following accommodations are equally medically and educationally necessary. Please provide with appropriate accommodations.

**DOCTOR SIGNATURE** – @DATE@
Thank You