

# Sleep and Headache

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# FINANCIAL DISCLOSURE

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- No relevant financial relationships



# OBJECTIVES:

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1. Accurately classify headaches based on International Headache Society Criteria
2. Choose appropriate studies for further evaluation based on patient history and physical findings.
3. Describe the relationship between headache disorders and sleep disorders.
4. Formulate an effective plan for the treatment of headache and co-morbid sleep disorders.



# HEADACHE TYPES

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- Primary Headaches
  - Migraine
  - Cluster
  - Tension
- Secondary Headaches
  - Intracranial Tumors
  - Intracranial Hemorrhages
  - Meningitis
  - Pseudotumor Cerebri
  - Temporal Arteritis...

# THE SINISTER TRIO

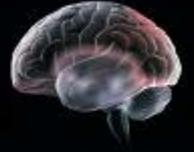
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- First
- Worst
- Cursed

# THE FRIENDLY TRIO

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- Normal History
- Normal Exam
- Family History



# IMAGING

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- There are no concerning findings with this patient....When do I perform an imaging study?



# AAN Guidelines

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The following symptoms significantly increase the odds of finding a significant abnormality on neuroimaging in patients with non-acute headache:

- Rapidly increasing headache frequency
- History of lack of coordination
- History of localized neurologic signs or a history such as subjective numbness or tingling
- History of headache causing awakening from sleep (although this can occur with migraine and cluster headache)



# IMAGING LINE...

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- Your headache symptoms sound very consistent with \_\_\_\_\_.
- Your normal neurologic examination and family history further suggests this diagnosis.
- Let's proceed with x, y, z treatments.
- If your headaches worsen or do not respond to treatment, we can proceed with an MRI scan for further evaluation.



# PITFALLS FOR THE LINE

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- High Anxiety
- Already Failed Multiple Treatment Plans
- High Frequency/Intensity Headaches



# CLASSIC VS. COMMON?

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# MIGRAINE DIAGNOSTIC CRITERIA



- Migraine Without Aura (Common Migraine)
  - At least 5 attacks
  - Last 4-72 hours
  - Has 2 of the following
    - Unilateral, Pulsating Quality, Mod/Severe Intensity, Aggravated by physical activity
  - Has 1 of the following 3
    - Nausea, Vomiting, or Both Photo AND Phonophobia
  - Not attributed to another disorder

# MIGRAINE DIAGNOSTIC CRITERIA



- Migraine With Aura (Classic Migraine)
  - At least 2 attacks
  - Migraine aura fulfils criteria for visual, sensory, or language aura
  - Last 4-72 hours
  - Has 2 of the following
    - Unilateral, Pulsating Quality, Mod/Severe Intensity, Aggravated by physical activity
  - Has 1 of the following 3
    - Nausea, Vomiting, or Both Photo AND Phonophobia
  - Not attributed to another disorder

# TENSION-TYPE HEADACHE DIAGNOSTIC CRITERIA



- DIAGNOSTIC CRITERIA
  - Headache lasting from 30 minutes to 7 days
  - Headache has at least two of the following characteristics:
    - Bilateral location
    - Bressing/tightening (non-pulsating) quality
    - Mild or moderate intensity
    - Not aggravated by routine physical activity such as walking or climbing stairs
  - Both of the following:
    - No nausea or vomiting (anorexia may occur)
    - No more than one of photophobia or phonophobia
- Rarely present with TTH as a chief complaint



# TAC-Trigeminal Autonomic Cephalgias

- SUNA/SUNCT → 5-240 seconds
  - Short-lasting Unilateral Neuralgiform headache with
    - Autonomic features
    - Conjunctival injection and Tearing
- Paroxysmal Hemicrania → 2-30 minutes (indomethacin)
- Cluster → 15-180 minutes
- Hemicrania Continua → Continuous (indomethacin)
  - Not officially a TAC



# CLUSTER DIAGNOSTIC CRITERIA

- Severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15-180 minutes if untreated
- Headache is accompanied by at least one of the following:
  - Ipsilateral conjunctival injection and/or lacrimation
  - Ipsilateral nasal congestion and/or rhinorrhoea
  - Ipsilateral eyelid edema
  - Ipsilateral forehead and facial sweating
  - Ipsilateral miosis and/or ptosis
  - A sense of restlessness or agitation
- Attacks have a frequency from one every other day to 8 per day



# PAIN AND SLEEP

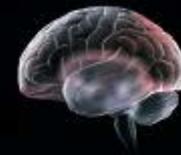
- Sleep dysfunction
  - Classically thought that chronic pain can affect sleep continuity and sleep architecture
  - Conversely sleep deprivation can increase pain sensitivity in acute and chronic pain states
    - Hyperalgesia to heat, cold, blunt pressure, and pinprick stimuli demonstrated
  - Sleep deprivation can interfere with analgesic treatments involving opioid and serotonergic mechanisms of action

# PRIMARY HEADACHES AND SLEEP DISORDERS



- Chronic daily, morning, or "awakening" headaches are suggestive of a sleep disorder
- Sleep apnea can present as a de novo daily headache or an exacerbation of cluster, migraine, tension-type, or other primary headache disorder
- Insomnia is the most prevalent sleep disorder in chronic migraine and tension-type headache
- Insomnia and chronic headache increase the risk for depression and anxiety.
- Inadequate sleep, oversleeping, and shift work can serve as triggers for migraine and tension-type headache
- Snoring and sleep disturbances are independent risk factors for progression from episodic to chronic headache

# PRIMARY HEADACHES AND SLEEP DISRODERS



- Chronic migraine and chronic tension-type headache
  - Two days of either high stress or low sleep were strongly predictive of headache
  - Two days of low stress or adequate sleep were protective.
  - Headache activity highest when high stress and low sleep occurred concurrently during the prior 2 days, denoting an additive effect.



# CLUSTER HEADACHE

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- Attacks have a circadian rhythmicity
  - Same time of year, same time of day
- Norwegian Study Fifty-eight men (aged  $49.2 \pm 13.6$ ) and 12 women (aged  $49.7 \pm 15.5$ )
  - 40% chronic insomnia
  - 49% were shift workers
  - Insomnia was significantly associated with shift work and experiencing longer-lasting cluster bouts.
  - 37% had a seasonal association
  - 80% often or always had headache attacks during sleep,
    - The most frequent time interval being at 12:00-4:00 am.
  - Shift workers were significantly more likely to see lack of sleep as a cluster attack trigger than daytime workers.

# DUAL DUTY HEADACHE PREVENTATIVE TREATMENTS



- Antiepileptic Drugs
  - Topiramate (obesity),
  - Pregablin/Gabapentin (sleep dysfunction, restless leg syndrome)
- Tricyclic Antidepressants
  - Amitriptyline (sleep dysfunction)
  - Weak antidepressant at low doses, especially for Russian Leaders



# HYPNIC HEADACHE

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- Also known as ‘alarm clock’ headache
- Diagnostic Criteria
  - Developing only during sleep, and causing awakening
  - Occurring on 10 days per month for >3 months
  - Lasting 15 minutes and for up to 4 hours
  - No cranial autonomic symptoms or restlessness
- Usually starts in patients > 50 yo
- Mostly mild-moderate with tension type features
- Can be severe in 1/5 of patients with migrainous features



# HYPNIC HEADACHE

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- Probably not related to sleep stage
- MRI study showed hypothalamic grey matter volume reduction
- Lithium, caffeine, melatonin and indomethacin have been noted to be effective treatments
- Caffeine taken as a cup of strong coffee seems to be the best acute and prophylactic treatment option<sup>2</sup>
- Underlying secondary causes including sleep apnea, nocturnal hypertension, and hypoglycemia should be ruled out

1. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). *Cephalalgia*. 2013 Jul;33(9):629-808.

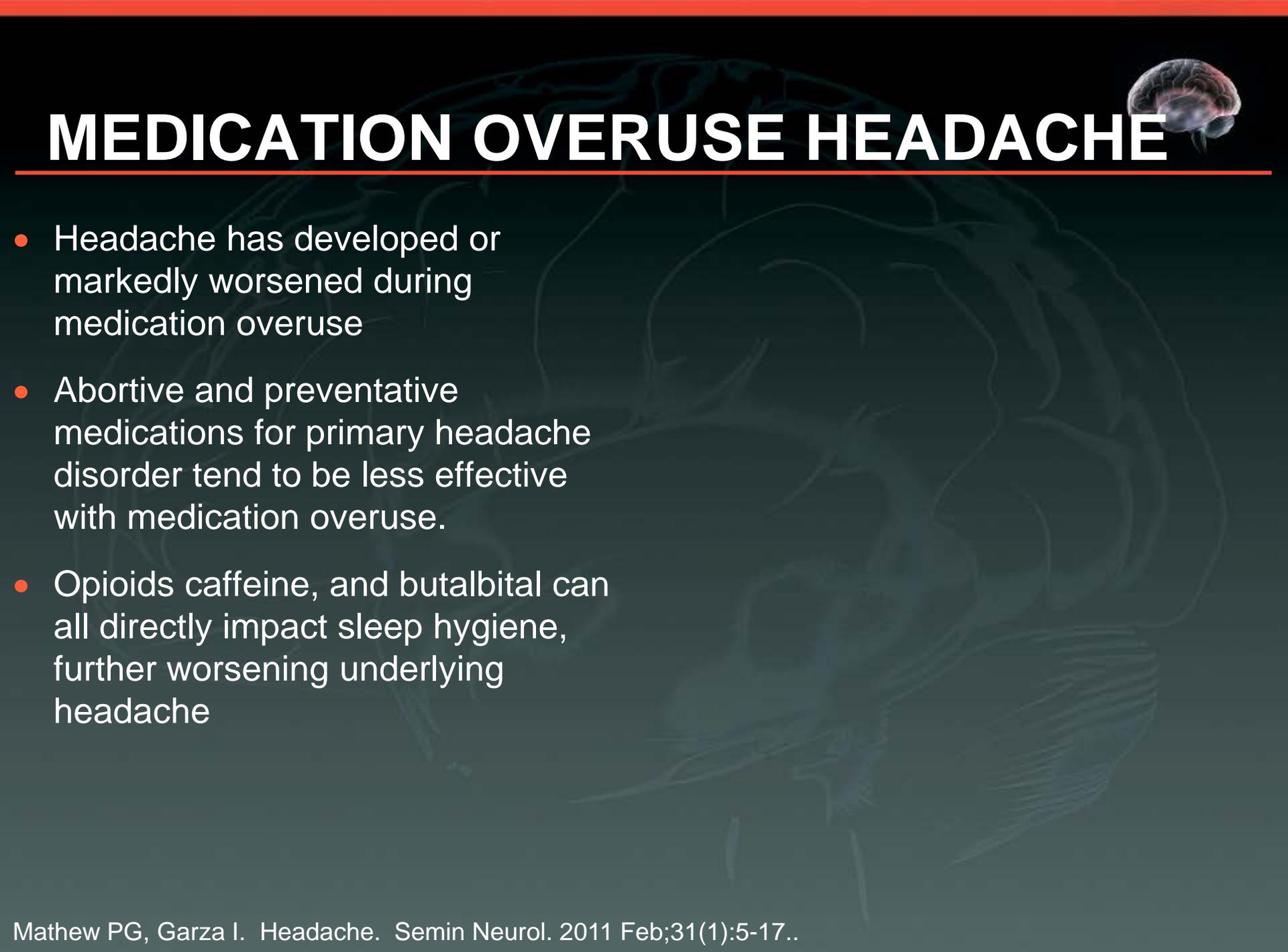
2. Holle D, Naegel S, Obermann M. Hypnic headache. *Cephalalgia*. 2013 Dec;33(16):1349-57.

# MEDICATION OVERUSE HEADACHE



- Previously called “rebound headache
- Headache present on 15 days/month fulfilling criteria
- Ergotamine, triptans, opioids, or combination analgesic medications (caffeine, butalbital) on 10 days/month on a regular basis for >3 months
- Simple analgesics or any combination of ergotamine, triptans, analgesics, opioids on 15 days/month on a regular basis for >3 months
- Opiate usage 8 days per month and barbiturate usage 5 days per month were both associated with progression of migraines into medication overuse headaches

# MEDICATION OVERUSE HEADACHE



- Headache has developed or markedly worsened during medication overuse
- Abortive and preventative medications for primary headache disorder tend to be less effective with medication overuse.
- Opioids caffeine, and butalbital can all directly impact sleep hygiene, further worsening underlying headache



# SLEEP OR GRAVITY?

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- Brain Tumors
  - Worsen with lying flat (sleep)
  - Worst pain tends to occur upon awakening and headache can awaken people from sleep



# SLEEP OR GRAVITY?

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- Idiopathic intracranial hypertension (pseudotumor cerebri)
  - Worsen with lying flat (sleep)
  - Worst pain tends to occur upon awakening and headache can awaken people from sleep



# SLEEP OR GRAVITY?

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- Intracranial hypotension
  - Improves with lying flat (sleep)
  - Lower pain levels upon awakening
  - Worst pain tends to be after being upright

# MIGRAINE TRIGGER SITE DEACTIVATION SURGERY



- Surgical Deactivation of 4 Potential Trigger Sites
  - Intranasal Trigger Site
    - Referred to as a contact point headache in neurology literature
    - Trigeminal nerve irritation from contact between the septum and lateral nasal wall
    - Septoplasty and turbinectomy
    - Direct pain improvement?
    - Improvement of airway and sleep?

Rozen TD. Intranasal contact point headache: missing the "point" on brain MRI. *Neurology*. 2009 Mar 24;72(12):1107.

Mathew PG. *A Critical Evaluation of Migraine Trigger Site Deactivation Surgery*. *Headache*. 2013 Oct 3.

# MY APPROACH TO SLEEP & HEADACHE...

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- Rapid sleep assessment including duration of sleep, interruptions, feeling rested after sleep, daytime drowsiness, daytime naps, snoring, caffeine consumption
  - Bathroom
  - Pets
  - Partner
- Discuss sleep dysfunction as a headache trigger
- Motivate the patient with other issues
  - Low energy, mood issues, irritability
  - cognitive/memory issues
  - Risk of stroke, heart attack, and dementia

# MY APPROACH TO SLEEP & HEADACHE...

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- Consider sleep study/sleep referral
- Consider psychological referral for CBT
- Consider pharmacologic interventions
- Consider ENT referral
  - Enlarged tonsils, tonsilliths, and snoring

# THANK YOU!!!



**JOHN R. GRAHAM HEADACHE CENTER**

**FELLOWS AND STAFF**

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