Headaches after Brain Injury
NeuroNights: Feb 9th, 2022

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NeuroNights: Headaches

Objectives

Upon completion, attendees will understand:

- Prevalence of headaches in brain injury
- Where to find resources / education for headaches and brain injury
- Lifestyle modifications for managing headaches
Acute Post-traumatic headache

- Most common symptom after minor head injury
- 94% of athletes with sports-related concussion have headache

Populations

- Some VERY different populations:
  - Military
  - Athletes
  - Accident victims
  - Assault victims
  - Workplace injury

- We always ask about pending litigation, worker’s compensation claims, and of course future plans in sport with athletes.
Headaches

Brain Injury

• "Headache is one of the most common symptoms after traumatic brain injury (often called “post-traumatic headache”). Over 30% of people with moderate to severe TBI report having headaches which continue long after injury. An even larger percentage people with mild TBI complain of headache." (37-69%)
  • Post-surgical
  • Migraines
  • Tension-type
  • Cervicogenic
  • Rebound
  • Medication overuse
Headache after Brain Injury

TBI Model Systems Handout

English

Headaches after Traumatic Brain Injury

December 2021

This fact sheet provides information on the causes, types, and treatment options for headaches after traumatic brain injury (TBI).

Headache is one of the most common symptoms after traumatic brain injury (often called "post-traumatic headache"). Over 30% of people with moderate to severe TBI report having headaches which continue long after injury. An even larger percentage of people with mild TBI complain of headache.

Why are headaches a problem after brain injury?

Headaches after TBI can be long-lasting, coming and going even beyond one year. Headaches can make it hard for you to carry out daily activities or can cause you to have more difficulty thinking and remembering things.

Why do headaches happen after brain injury?

Right after a severe TBI, people can have headaches because of the surgery on their skulls, a skull fracture, or because they have small collections of blood or fluid inside their skulls.

Headaches can also occur soon after mild to moderate injury or, most commonly in the case of severe TBI, after the initial healing has taken place. These headaches can be caused by a variety of conditions, including a change in the brain caused by the injury, neck and skull injuries that have not yet fully healed, tension and stress, or side effects from medication.

What are some typical kinds of headaches after TBI?

Migraine headaches

These headaches happen because an area of the brain becomes hypersensitive and can trigger a pain signal that spreads out to other parts of the brain (like the ripples that spread out after you drop a pebble in water). Migraine headaches typically have the following features:

- Dull, throbbing sensation, usually on one side of the head.
- Nausea or vomiting.
- Light and sound sensitivity.
- Pain level rated as moderate to severe.
- A "warning" signal that a migraine is coming on, such as seeing spots or bright lights. This is called an "aura."

The Traumatic Brain Injury Model System is sponsored by the National Institute of Disability, Independent Living, and Rehabilitation Research, U.S. Department of Health and Human Services' Administration for Community Living. (See [http://www.msktc.org/tbi/model-system-centers-for-more-information](http://www.msktc.org/tbi/model-system-centers-for-more-information)).

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Headache after Brain Injury
TBI Model Systems Handout
Spanish
Changes you can make

• Work with a neurologist
  • Good 1st step
  • Discuss medications or alternative options

• Track your migraines
  • Identify triggers to better understand how to cope or what to avoid
  • This can also help your healthcare provider tailor treatment toward your needs

• Manage triggers
  • Diet
  • Stress
  • Light/noise
  • Vision
  • Posture (Ergonomics)
  • Sleep

• Conserve your Energy

• Exercise
Tracking your headache

- Can be done electronically via apps or can be done on paper, depending on your preference.
  - Paper tracking is simple to manage and view. The following is an example of paper tracking that shows headache trends for each month of the year. This provides a simple visual and allows you to count headache days per month.

| 2022 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| January |
| February |
| March |
| April |
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| June |
| July |
| August |
| September |
| October |
| November |
| December |
Tracking your headache using an app

Apps can enable you to track on the go, at any time, and often you can share data with your doctor. Apps can also provide information regarding trends in your migraine history. For example, an app can tell you when you commonly get migraines (morning, afternoon, evening), which can be helpful information for you and your doctor.

#1 headache and migraine App is currently Migraine Buddy
Diet

• Missed meals, caffeine withdrawal, food triggers and alcohol consumption are all known to be headaches/migraine triggers.

  • **Caffeine**: Maintain a consistent caffeine intake. If you normally drink 2 cups of coffee per day, try to be consistent. Caffeine withdrawal can trigger headaches/migraines. Your neurologist may recommend you reduce your caffeine intake, but do so gradually to avoid withdrawal.

  • **Hydration**: Attempt to consistently drink 60oz of water per day. If this is difficult for you, get an app, such as WaterMinder, or a large water bottle to encourage you to meet that goal.

  • **Alcohol**: Be aware of what types of alcohol you can tolerate, in what quantity. If you are consistently getting headaches, try to avoid alcohol.

  • **Food**: If you can identify foods that trigger an attack, reduce or eliminate them from your diet. Your neurologist can suggest foods to investigate that are common triggers including chocolate, onions, gluten, or MSG.
Conserving your energy

• Prioritize when you plan your day.
  • Keep this question in mind: “Is it absolutely necessary that I do this today?”
  • If possible, minimize stressful or rigorous activities on days when you have headaches.
  • Save complex or difficult tasks for days when you feel better. Consider rescheduling social activities if you are not feeling well.
  • Often alternating tasks that take a lot of energy with tasks that take little energy will allow you to last longer throughout the day.
  • Rest in between activities when needed. Listen to your body, rest breaks are important (use chair/recliner, not bed)
Vision

• If you experience blurry vision and/or double vision this can commonly cause headaches.
  o Discuss with your neurologist as to whether you should see your primary eye doctor and/or get a referral to an Occupational Therapist for further evaluation.

• Light sensitivity
  o Blue spectrum filtering screen protectors for phone or computers
  o Free blue light-filtering software for computer (e.g., f.lux)
  o Night Shift on iPhone, iPad under Settings > Display and Brightness > Night Shift
  o Blue light-blocking or filtering glasses (e.g., UVEX- shop online)
  o Low blue/amber light bulbs
Sleep Disorders in TBI

• 30-84% of patients with TBI report sleep disorders
  • 60% experience long term difficulties with sleep

• Most frequent disorders:
  • Mild TBI = insomnia and circadian rhythm disorders
  • Mod and Severe TBI = hypersomnolence
  • Insufficient sleep maintenance and efficiency (50%), delay in falling asleep (36%), waking early (38%), nightmares (27%)
  • Chronic TBI = 46% found to have obstructive sleep apnea, post-traumatic hypersomnia, narcolepsy and/or periodic limb movements / restless leg syndrome during sleep

• Survivors with multiple TBIs are especially susceptible

Paredes I et al 2021
Sleep Disorders after Brain Injury
TBI Model Systems Handout

How common are sleep problems following a TBI?
Many people who have brain injuries suffer from sleep disturbances. Not sleeping well can increase or worsen depression, anxiety, fatigue, irritability, and one’s sense of well-being. It can also lead to poor work performance and traffic or workplace accidents. A review of sleep disorder studies and surveys suggest that sleep disorders are three times more common in TBI patients than in the general population and that nearly 40% of people with TBI experience long-term difficulties with sleep. Women were more likely to be affected than men. Sleep problems are more likely to develop as the person ages.

What are types of sleep problems?
Sleep disturbances have been found in people with all severities of brain injuries – from mild to severe. Sleep is a complex process that involves many parts of the brain. For this reason, and depending on the location and extent of injury, many different kinds of sleep disturbances can occur after brain injury.

Common sleep disorders include:
- Insomnia: Difficulty falling asleep, staying asleep, or waking up too early.
- Excessive Daytime Sleepiness: Excessive drowsiness.
- Narcolepsy: Falling asleep suddenly and uncontrollably during the day.

Common sleep syndromes include:
- Restless Leg Syndrome (RLS): Urges to move the legs because they feel uncomfortable, especially at night or when lying down.
- Bruxism: Grinding or clenching teeth.
- Sleep Apnea: Brief pauses in breathing during sleep, resulting in reduced oxygen flow to the brain and causing loud snoring and frequent awakenings.
Sleep Disorders after Brain Injury

TBI Model Systems Handout

Spanish

El sueño y las lesiones cerebrales traumáticas

¿Cuáles son los problemas del sueño después de una lesión cerebral traumática (TBI, por sus siglas en inglés)?

Muchos pacientes que tienen lesiones cerebrales sufren problemas del sueño. No dormir bien puede aumentar o empezar la depresión, la ansiedad, el cansancio, la irritabilidad y el sentimiento de bienestar de la persona. También puede resultar en bajo rendimiento en el trabajo o accidentes de tráfico o accidentes en el lugar de trabajo. Una revisión de los estudios y encuestas sobre los trastornos del sueño sugiere que los trastornos del sueño son tres veces más comunes en los pacientes con TBI que en la población en general, y que alrededor del 60% de las personas con TBI tienen dificultades al dormir a largo plazo. Las mujeres se afectan más que los hombres. Es más probable desarrollar problemas del sueño según la persona en edad.

¿Cuáles son los tipos de problemas del sueño?

Se han hablado del sueño en personas con lesiones cerebrales de todo tipo de severidad de leve a severa. Dormir es un proceso complejo que involucra muchas partes del cerebro. Por esta razón, y dependiendo de la localización y la extensión de la lesión, pueden ocurrir muchos diferentes tipos de problemas del sueño después de una lesión cerebral.

Trastornos del sueño comunes incluyen:

- Insomnio: Dificultad para quedarse dormido o mantenerse dormidos; o dormir y no sentirse descansados. El insomnio puede empezar con otros problemas que resultan de una lesión cerebral, inclusive dificultades cognitivas (para pensar) y problemas de conducta. El insomnio dificulta aprender cosas nuevas. El insomnio a menudo empeora directamente después de una lesión y con frecuencia mejora según pasa el tiempo.
- Somnolencia excesiva durante el día: Somnolencia a menudo.
- Síndrome de fase de sueño retrasada: Piernas desordenadas de sueño.
- Narcolepsia: Quedarse dormido repentinamente e indiferenciadamente durante el día.

Síndromes del sueño comunes incluyen:

- Síndrome de las piernas inquietas (RLS, por sus siglas en inglés) impulso de mover las piernas porque se sienten incomodas, especialmente durante la noche o cuando se está acostado.
Sleep Disorders after Brain Injury
OSU NeuroNights Recording

April 2021 Topic
Sleep is Prevention
Check out the home page for more info
Go.osu.edu/neuronights
Sleep

Sleep and Headaches

• Sleep can both provoke and relieve headache
• Those with sleep disorders often have more frequent and severe headaches

<table>
<thead>
<tr>
<th>Type of Headache</th>
<th>Associated Sleep Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning headache</td>
<td>snorers, apneic patients, circadian rhythm disorders, parasomnias, nightmares x1/wk</td>
</tr>
<tr>
<td>Chronic Headache</td>
<td>snorers, apneic patients, circadian rhythm disorders, parasomnias, nightmares x1/wk, insomnia</td>
</tr>
<tr>
<td>Migraine</td>
<td>circadian rhythm disorders</td>
</tr>
<tr>
<td>Cluster Headache</td>
<td>circadian rhythm disorders, disordered breathing</td>
</tr>
<tr>
<td>Tension</td>
<td>Reduced sleep time and efficiency, decreased sleep latency, frequent waking, increased nocturnal movements</td>
</tr>
</tbody>
</table>
Sleep

What can you do?

• Go to sleep and wake up at the same time every day
• Use your bed from only sleep and sexual activity
• Develop a relaxing bedtime routine
• Exercise
  • Avoid moderate to vigorous exercise 2-3 hrs before bed
  • Do exercise in morning or early afternoon as guided by your healthcare professional
• Avoid a large meal or spicy food 2-3 hrs before bed
• Avoid Caffeinated foods and drinks 4 hrs before bed
• Avoid alcohol or smoking 3-4 hrs before bed
• Avoid daytime napping. Limit naps to 30 min
• Make your sleep environment comfortable and relaxing
• Talk to your doctor or health professional regarding underlying sleep conditions

Siensukon CF et al 2017
Ergonomics

• Can help reduce migraine, cervicogenic and/or tension headaches
  • Madsen et al found strength training decreased headache frequency by 11% and duration by 10%, while seated ergonomic and postural corrections reduced headache frequency by 24% and duration by 27%

• Improper pillow support leads to increase in cervicogenic headaches
  • Neck pain and poor quality of sleep

Ergonomics

Desk / Computer Recommendations
Ergonomics

Desk / Computer Recommendations

Amazon: Light Box Pad Stand
$15

Amazon: Light Box Pad Stand
$25-30
Ergonomics

Cell Phone Recommendations

• Take a break every 15 – 20 min

• Hold phone / screen slightly below eye level

• Use a headset if possible
Ergonomics

Sleep Recommendations

• Back Sleeping
  • Best for spine and neck
  • Minimal to no torsion or strain
  • Goal is a neutral spine – typically 1 pillow

• Side Sleeping
  • Requires an increased pillow height due to width of shoulders – typically 1-2 pillows
  • 75% of patients with sleep apnea had significant improvement in sleep

• Stomach Sleeping
  • Not recommended – increases torsion on ligaments, discs and joints in neck; increases muscle strain

Ren S et al 2016 and Oksenberg A et al 2020
Exercise

Reducing Headaches

• Start with a graded / subthreshold exercise program prescribed by a healthcare professional
  • Aerobic exercise has positive effects in the treatment of migraines, reducing frequency
    • Helps to reduce hormone and stress levels
  • Resistive exercise has positive effects in reducing tension headaches

• Daily exercise can improve sleep, reduce stress and reduce triggers
  • Perform in morning or early afternoon
  • Cardio, strength and/or stretching programs

Siengsukon CF et al 2017 and Machado-Oliveira L et al 2020
Yoga

- Reduction in headache frequency, duration and intensity
- Reduction in medication intake
- Reduction in somatic symptoms accompanied by headache
- Reduced stress perception, anxiety and depression

Kim SD 2015
Yoga
LoveYourBrain

• Online Programs
  • Yoga
  • Group Discussion
  • Mindfulness

• https://www.loveyourbrain.com/
Pain Management

Take Home Message

• Encourage a multidisciplinary evaluation to assess origin of headache and provide individualized plan and education

• Follow-up with physician / headache specialist

• Enrollment in OSU Pain School

• Referral to OSU Chronic Pain Program
  • Evaluation by PT, OT, Rehab Psychology and Pain Physicians
Pain Management

Virtual Interdisciplinary Pain School

Description: Virtual Interdisciplinary Pain School is a four-session educational program for adults living with chronic pain conditions. This program is an introduction to healthy lifestyle and specialized skills for living a full life with pain. Pain School uses an interdisciplinary team approach and includes staff from nursing, social work, occupational therapy, physical therapy, nutrition, and pharmacy.

Schedule: Wednesday 9:30 – 11 a.m.
Meets weekly for four weeks
Offered every other month

Mode of Delivery: Virtual via Zoom
Link will be sent through MyChart
Technology assistance will be provided as needed

Program Format:
- Four group virtual sessions led by a pain team nurse practitioner, social worker, physical therapist, occupational therapist, and other members of the treatment team, including a clinical pharmacist and registered dietitian
- Individual counseling, nutrition services, pharmacy consultation, and brief behavioral intervention for insomnia available upon request

Who Should Attend Virtual Pain School? Individuals with chronic non-cancer pain lasting longer than 3 to 6 months will benefit from this program. Common chronic pain conditions include:

- back pain
- neck & shoulder pain
- degenerative disc disease
- arthritis
- sciatica nerve pain
- fibromyalgia
- joint pain
- knee pain

Attendance Policy:
If you are unable to attend, please contact our staff at 614-366-0722.

Contact Us: For more information about the program, contact Lauren Tiemeier (614-366-0722).

Virtual Interdisciplinary Pain School Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Pain &amp; Wellness Education Topics</th>
<th>STAFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2/2</td>
<td>• What is chronic pain and what are the best treatment approaches?</td>
<td>Pain Social Worker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bio-psycho-social model of pain</td>
<td>Pain Nurse Practitioner</td>
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<tr>
<td></td>
<td></td>
<td>• Active treatments versus passive treatments</td>
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<td></td>
<td></td>
<td>• Difference between hurt (pain) and harm (damage, injury)</td>
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<td></td>
<td></td>
<td>• Difference between pain sensations and pain behavior</td>
<td></td>
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<tr>
<td>2</td>
<td>2/9</td>
<td>• Spine health</td>
<td>Pain Physical Therapist</td>
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<td></td>
<td></td>
<td>• Posture retraining</td>
<td>Pain Social Worker</td>
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<td></td>
<td></td>
<td>• Body mechanics</td>
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<td></td>
<td></td>
<td>• Activity management &amp; pacing skills</td>
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<td></td>
<td></td>
<td>• Pain self-management skills</td>
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<tr>
<td>3</td>
<td>2/16</td>
<td>• Pain medications as part of your care plan</td>
<td>Pain Pharmacist Dietitian</td>
</tr>
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<td></td>
<td></td>
<td>• Different types of pain medications</td>
<td>Pain Social Worker</td>
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<td></td>
<td></td>
<td>• Anti-inflammatory diet</td>
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<td></td>
<td></td>
<td>• Mindful eating practices</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2/23</td>
<td>• Pain and sleep</td>
<td>Pain Social Worker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mindfulness skills</td>
<td>Pain Occupational Therapist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Program review and next steps in your journey</td>
<td></td>
</tr>
</tbody>
</table>

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Pain Management
Integrative Medicine

- Massage Therapy
  - Migraines, cervicogenic and tension headaches

- Osteopathic Manipulation
  - Migraines, cervicogenic headaches

- Acupuncture / Dry Needling
  - Migraines, cervicogenic and tension headaches

- Mindfulness / Meditation
  - Undoes the body's stress response, reduces muscle tension, decreases heart rate and blood pressure
    - Lead to improved sleep --> decreased headaches
    - Reduced stress, depression, anxiety --> decreased headaches

Wells RE et al 2017
Sleep Disorders after Brain Injury
OSU NeuroNights Recording

June 2021 Topic
Integrative Medicine for Brain Injury

Check out the home page for more info
Go.osu.edu/neuronights
Presenters

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Thank you!
References


• Siengsukon et al. Sleep health promotion: practical information for physical therapists. Phys Ther. 2017; 97: 826-836
References

• Cervicogenic Headaches [Pamphlet]. (2012). Columbus, OH: The Ohio State University Wexner Medical Center.
References

• Cervicogenic Headaches [Pamphlet]. (2012). Columbus, OH: The Ohio State University Wexner Medical Center.


