

Occupational Health Clinics for Ontario Workers Inc.

Centres de santé des travailleurs (ses) de l'Ontario Inc.

Ergonomics & Sleep

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Why Do We Need Sleep?

- TOTAL REPAIR Sleep helps us recharge physically and mentally
- While sleeping :
 - Your brain is eliminating waste products
 - Your muscles, bones, and organs are repairing themselves
 - Sleeping assists in keeping your immune system healthy



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Source: https://www.sleepassociation.org/about-sleep/what-is-sleep/



ARE CANADIAN ADULTS GETTING ENOUGH **SLEEP?**

Current But... recommendations¹ are: 1 in 4 adults aged 18-34 1 in 3 adults aged 35-64* 1 in 4 Ages 18-64 Ages 65+ adults aged 65-79 **7–8 HOURS** are **not** getting **7-9 HOURS** enough sleep. of sleep/night of sleep/night Significant difference between males and females Let's talk about **sleep quality**, shall we? 1 in 2 adults have trouble 1 in 5 adults DO NOT 1 in 3 adults have difficulty going to sleep or staying asleep. find their sleep refreshing. staying awake during waking hours.

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Canadian Health Measures Survey (CHMS) 2014–2015.



A number of factors are related to **insufficient sleep** in adults:

MORE SEDENTARY TIME

Adults who get **insufficient sleep** report an average of **4.0 hours** of sedentary time a day compared to an average of **3.5 hours** for adults who get **adequate sleep**.

CHRONIC STRESS

36.3% of adults who get **insufficient sleep** report having chronic stress compared to 23.2% of adults who get **adequate sleep**.

POOR MENTAL HEALTH

12.3% of adults who get **insufficient sleep** report having poor mental health compared to 5.8% of adults who get **adequate sleep**.

Good sleep hygiene could lead to better sleep^{2,3}:

- Avoid alcohol, caffeine, and nicotine before bed
- Maintain a regular bedtime/waketime
- Practice relaxation and mindfulness-based stress reduction techniques
- Reduce noise in the sleeping environment

- Restrict naps to 30 minutes
- Exercise regularly
- Review medications with your physician/pharmacist regularly



Adults need seven to nine hours of sleep.
55% of adults find sleep refreshing most of the time.

•55% of women have trouble falling asleep.
•Canadian teenagers sleep only 6.5 to 7.5 hours.
•We spend two hours every night dreaming.
•On average, Canadians wake up around 7 am.
•A 10% increase in body weight raises the risk of sleep apnea by six times.



Overworked and stressed, we often ignore sleep issues. But not getting enough sleep can lead to weight gain, diabetes, anxiety, depression, and cardiovascular disease.

Ζz



31% of Canadians say they don't get enough sleep. This makes Canada the joint third most sleep-deprived nation (with the US), after the UK and Ireland.

People who have insomnia have a seven-time higher risk of work-related accidents.

(Source: Sleep Foundation)

Severe insomnia can make people prone to workrelated accidents due to a lack of focus and attention.

The amount of errors nurses make if they work longer than **12.5 hours** is three times higher than those working **8.5-hour shifts.**

North Americans can lose up to 10 million working hours a year due to lowered performance as a result of tiredness.

(Source: CBC, Nature) The "combined cost of insufficient sleep" for Canada, the US, the UK, Germany, and Japan is estimated at over \$600 **billion** per year.

CANADIANS SUFFER FROM SOME TYPE OF SLEEP DISORDER. REVIEWLUTION

AROUND 30% OF

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https://reviewlution.ca/resources/sleep-statistics-canada/

Sleep Deprivation

Sleep deprivation is defined as not obtaining adequate total sleep. Insufficient sleep adversely affects how the body functions.

Negative Impacts of Sleep Deprivation

Many studies make it clear that sleep deprivation is dangerous. Sleep-deprived people who are tested by using a driving simulator or by performing a hand-eye coordination task perform as badly as or worse than those who are intoxicated.





Sleep Deprivation

Why Does Sleep Deprivation Cause Workplace Accidents?

- Leads to cognitive impairment
- Degrades cognitive processing, affecting everything from memory to reflexes.
- Less sleep slows down reaction time and decision making
- More likely to misjudge your abilities and take risks.
- Excessive sleepiness can lead to consequential errors and accidents that gravely impact the workplace.





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Stages of Sleep

Stage 1 Pre- Sleep

- Light sleep, drift in and out and can be awoken easily. Eyes move very slowly, and muscle activity slows.
- Sudden muscle contractions.

Stage 2 Light Sleep

- Eye movements stop and our brain waves become slower Stage 3 and Stage 4 Moderate and Deep Sleep
- Extremely slow brain waves, interspersed with smaller, faster waves. It is very difficult to wake someone during stages 3 and 4 (deep sleep). There is no eye movement or muscle activity.

REM (Rapid Eye Movement) Sleep

- Breathing becomes more rapid, irregular, and shallow, eyes jerk rapidly in various directions, heart rate increases, blood pressure rises.
- Occurs about 70 to 90 minutes after we fall asleep.
- Dreams

SLEEP CYCLE





Pain – Sleep Interaction

People with Pain report problems with:

- Going to Sleep
- Staying Asleep
- Waking Too Early
- Not getting enough sleep lowers your pain threshold
- Pain affects your ability to be active which affects quality of sleep and can make you anxious or stressed which also impact sleep



What is an MSD?

- Your body is made up of:
 - muscles, tendons, ligaments, joints, vertebrae, vertebral discs, nerves, and other tissues
 - This is known as the *musculoskeletal system*.
- Musculoskeletal disorders are injuries and disorders of the musculoskeletal system due to exposure of various risk factors



Examples of MSD







Psychosocial Force REPETITION Static Postures CONTACT STRESS VIBRATION **AWKWARD POSTURES Extreme Temperatures**

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Synergistic Effect

- Very Important!
- Combinations of force, posture, repetition, etc. can greatly increase the level of risk
- ↑ exposure time = ↑ injury risk





MSD risk factors that might be associated with sleep:

- Awkward Postures: placing undue stress upon joints
- Static Postures: sleeping in one position for extended periods of time
- Contact Stress: pressure points from laying in certain positions
- Force: increased at the joints as a result of awkward and static postures
- **Repetition**: due to requirement to sleep daily

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Source: https://www.physiomed.co.uk/uploads/guide/file/16/Physiomed_Sleeping_Posture_Digital.pdf

- We spend 40% of our lives in bed so the right bed, pillow,
 - and sleeping position are important. The right sleeping position posture can also help prevent problems from developing.
 - There are three main positions when in bed:
 - On the back
 - On either side

Sleeping Posture

• On the front





Sleeping Posture





Sleeping Posture

- In order to decrease the risk of sleep induced MSD, attention to sleeping posture is essential.
- Always try to maintain neutral postures as often as possible
- Neutral neck, back, and shoulder postures will decrease the risk of obtaining MSD







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Source: https://www.physiomed.co.uk/uploads/guide/file/16/Physiomed_Sleeping_Posture_Digital.pdf

Sleeping Posture - Back

- To keep your neck in a neutral position, make sure your pillow fills and supports the curve of your neck properly.
- Don't let your head tilt up as this indicates that your pillow is too high
- Don't let your chin poke up either, as this would indicate that your pillow is too low
- Place a pillow under your knees to help prevent any strain on your lower back
- The pillow used to support your head and neck should contour to the natural curvature of the cervical spine and allow its alignment with the rest of the spine.



Sleeping Posture - Side

- Place a pillow in-between your knees to help lower stress in the hip and improve circulation to the lower extremities.
- The pillow used to support the head should be of the proper size and density to keep the neck aligned with the rest of the spine.
- Avoid placing your head on arm or lifting your arm above your head as this can reduce blood flow, put pressure on nerves, and lead to stiff shoulders the following morning.
- Using a body pillow to hug and/or place between your knees is a good idea.
- You can also place another pillow underneath your top arm so that you do not rotate your mid-back too much and add strain to your top shoulder.



Sleeping Posture - Front

- Sleeping on your front is **not ideal** and should be avoided if possible.
- This position does not allow proper spinal alignment and may lead to neck and back pain.
- Sleeping on your stomach increases your low back sway and aches.
- It also leads to neck rotation
- Place a smaller pillow under your stomach to reduce low back sway and arch
- Place a thin pillow under your head to reduce neck rotation
- Try to avoid resting your head on your arms because this may lead to shoulder pain



Bed

Bigger beds are generally better

- More room to adjust posture
- More options for the support of limbs
- Most important when more than one person less disturbance while altering postures

Height

- How easy is it to get in and out?
- Feet should be flat while sitting on edge of bed
- Higher beds are easier to get off; harder to get on
- Lower beds are easier to get on; more difficult to get up from
- Low beds are worse for individuals with hip or back issues



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Mattress

The best mattresses are designed to conform to the spine's natural curves and keep the body in its most neutral postures

- Personal preference, body type, sleep postures, etc.
- Firm enough to support the body adequately
- Soft enough to be comfortable
- Too firm may create pressure points and take body away from neutral postures
- Too soft may create uneven support and cause deviations from neutral postures





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Mattress – How Firm?

- Back sleeper
 - On back slide hand between low back and mattress
 - Hand slides through easily with no gap, mattress has proper firmness
 - Hand slides through with clear gap, mattress is too firm
 - Hand must be forced through, mattress is too soft
- Side sleeper
 - If you can feel the mattress touching your body all the way from your ribs to your pelvis with similar pressure, firmness is alright
 - If there are gaps or areas of substantially less pressure, mattress is too firm
 - If there are areas with substantially more pressure or you feel like one or more body areas are lower, mattress is too soft







Mattress – How Firm?

- Two sleepers
 - If both are not similar build and weight, then firmness difficult to individualize
 - Compromise or accommodate for only one
 - Some allow for different firmness ratings on each side ideal



Mattress – Construction and Maintenance

Composition and quality of the mattress is important

- Memory foam mattresses are often recommended
 - Full memory foam mattress (not a topper) will conform to the body as it reacts to both pressure and temperature
 - Returns to original shape after use
 - Helpful when more than one person on same bed individual
 - May hinder postural changes during sleep
- "Turning" or "rotating" newer models not recommended know recommendations
- Lifespan = 5-8 years



Pillows

- Personal preference, body type, sleep postures, etc.
- May be used to support legs, low back, and/or head and neck
- Should support the natural curves of the body to maintain neutral postures
- Insert pillows into gaps between your body and the mattress
- Firm enough to support the body adequately
- Soft enough to be comfortable



Pillows - Head

The pillow for your head should support the natural curves of the neck and provide comfort and support

- Incorrect size may cause or aggravate neck or shoulder issues
- Back sleeper pillow should fill space between the head, neck, and mattress, so the head and neck remains in neutral posture
- Side sleeper pillow should fill space between the head, neck, and shoulder, so the head and neck remains in neutral posture





Pillows - Body

Body pillows should be placed into gaps between the body and the mattress

- Incorrect size or placement may cause or aggravate low back, hip, neck, or shoulder issues
- Back sleeper pillow should fill space between the low back and mattress (if required) to maintain neutral torso posture
- Back sleeper pillow should be placed beneath knees to slightly elevate the knees bringing pelvis into neutral posture
- Side sleeper pillow should be placed between the knees to prevent spinal rotation and reduce hip and low back stress
- Side sleeper pillow placement, height, and firmness very important



Pillows – "Ergonomic"

"Ergonomic", contoured, or orthopedic pillows *may* support the head, neck, and low back better than ordinary pillows.

- Shaped different than regular pillows
- Designed to accommodate the user's sleeping position and to minimize stress and tension
- Composed of memory foam or other form retaining material that offers additional support
- Vary is size dependent upon use sleeping, sitting, traveling, etc.
- Limit positional changes
- Individual good for some, not for others





Shift Work

Shift Work

- Increased fatigue due to disruption of ٠ circadian rhythm leading to reduced concentration, reaction time, motivation, and memory
- Increased risk of heart problems, digestive ۲ disturbances, and emotional and mental problems, all of which may be related to their sleeping problems.
- The number and severity of workplace • accidents also tend to increase during the night shift.
- Lead to chronic fatigue and insomnia •
- Disruption of sleep patterns •





Tips to Improve Sleep Among Shift Workers

Sleep		
	 Make sure that family and friends are aware of and considerate of the worker's sleep hours and needs Ensure you have a comfortable, quiet place to sleep during the day Air conditioning, telephone answering machine, foam ear plugs and good blinds are examples of devices that may improve the worker's sleep Make time for quiet relaxation before bed to facilitate better sleep (reading, breathing exercises, muscle relaxation techniques, etc.) 	Sleep on a set schedule to help establish a routine and to make sleep during the day easier Avoid strenuous exercise before sleeping because your body's metabolism will remain elevated for several hours and this makes sleeping difficult If failing to fall asleep after one hour, read a book or listen to quiet music If sleep still does not come, reschedule sleeping hours for later in the day

Improving Sleep

- **Develop a Sleep Routine**
- Be Active During the Day
- Eat Well Throughout the Day: Don't' go to bed on an empty or full stomach
- Avoid Caffeine & Alcohol
- Keep the Bedroom Dark
- **Reduce Noise**
- Avoid Using Technology in Bed
- Cool Room Temperature
- Do Not Look at the Clock
- **Relaxation Techniques**





when who ? where her ? when by what ? when hy what how now

Sleep Information Sheet:

https://www.ohcow.on.ca/wp-content/uploads/2022/12/infosheet_SLEEP_2.pdf

Podcast:

Part 1: <u>https://www.ohcow.on.ca/posts/ergonomics-and-sleep-part-1/</u> Part 2: <u>https://www.ohcow.on.ca/posts/ergonomics-and-sleep-part-2/</u>