

Sleep

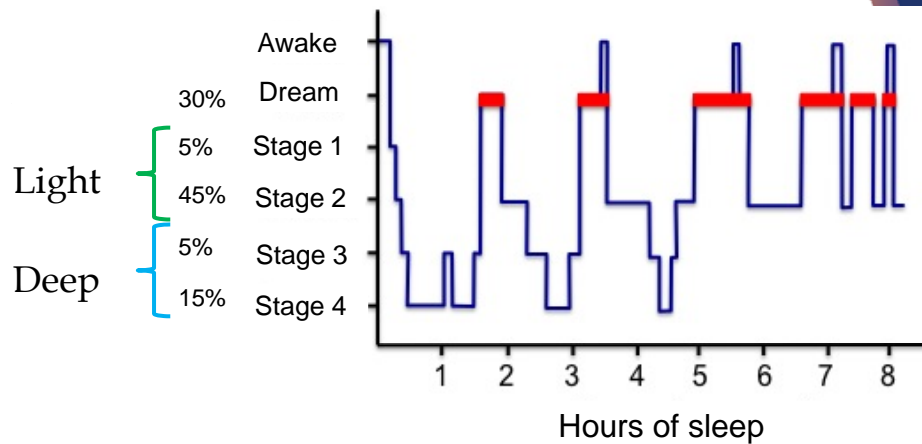
- A person needs to sleep
- Adult - 6 to 9 hours per day, average 7.5 hours
- Less than 6 hours - Exceptional cases
- Is characterized by Quantity et Quality



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Sleep stages



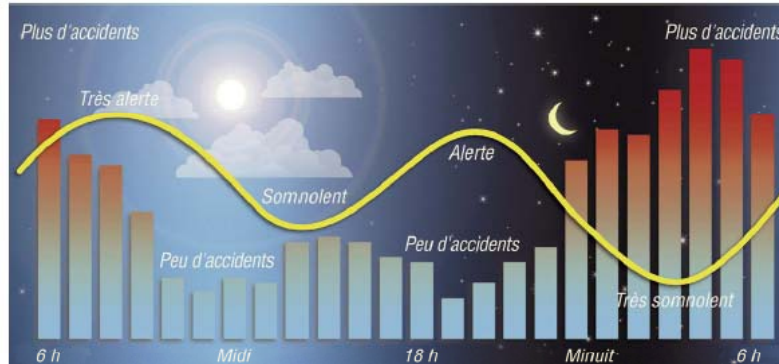
4 to 5 times per 8 hours



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Body's internal clock



* Mitler, MM. Et al. (1988), USA



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Individual Profile

Fishing season versus Out of season

- Total hours of sleep
- Time at which one falls asleep
- Wake-up time
- Nap
- Difficulties to fall asleep
- Waking-up during sleep



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Sleep Debt

- Quantity slept minus Usual quantity
- Debt must be paid
- Payments can be over several days
- Unpaid debt leads to risk of fatigue



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Fatigue

- Diminished physical and cognitive abilities
- Caused by lack of sleep
- Disruptions of body's internal clock
- Leads to sleepiness and sleep
- Comparable to alcohol consumption



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Effects on Performance

- Diminished attention and vigilance
- Slower reaction time
- Reduction in movements coordination
- Decision making is affected



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Signs of Fatigue

- More irritable than usual
- Communicates less
- Gets upset quickly
- Difficulties to concentrate
- Takes short-cuts
- Takes unusual risks
- Answers slowly to situations
- Completes work in the incorrect sequence



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[http://www.worksafebc.com/publications/health_and_safety/
by_topic/assets/pdf/BK44.pdf](http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/BK44.pdf)

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Fatigue Factors - Fishermen

- Awake for more than 17 consecutive hours
- Sleep difficulties
- Professional and personal worries
- Age, health, fitness, family life
- Eating habits, alcohol, medication/drugs, coffee



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Fatigue Factors - Work

- Irregular schedule
- 24 hours a day operations
- Number of crew
- Workload and practices
- Time of day



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Fatigue Factors - Boat and work conditions

- Comfort of the accommodations
- Vessel motion
- Temperature, humidity and noise



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Other Factors

- Fish stocks
- Fishing periods depending on type of fish
- Market price



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Sleep problems

- Examples: insomnia and sleep apnea
- Symptoms
 - Difficulties to fall asleep
 - Waking-up frequently
 - Waking-up very early
 - High body mass index
 - Snoring
 - Feeling tired
- To be discussed with a doctor



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Alcohol, prescriptions, over the counter medications, drugs, coffee, nicotine, etc...

- Negative effects on quality and quantity of sleep
- Substances to fight sleepiness
 - Helps to stay awake, but later on can affect quality of sleep
- Substances to help sleep
 - Helps to sleep, but can have prolong effects while awake



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Examples of Programs to manage Fatigue

Canadian Maritime Pilots
Instructor manual (TP 13960F)

<http://www.tc.gc.ca/fra/innovation/cdt-publication-tp13960f-13960f-602.htm>

Société de l'Assurance Automobile du Québec (SAAQ)
Fatigue in heavy trucking industry

http://www.saaq.gouv.qc.ca/lourds/fatigue_volant/index.php



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Principles – Fatigue Management

- Awareness
- Fatigue is not an acceptable situation
- Develop practical strategies
- Share best practices
- Offer accessible tools
- Everyone has a role to play
- Working together



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Knowledge

- Read the brochure
- Discuss fatigue
- Educate and monitor new crew members



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<http://www.maritimenz.govt.nz/Publications-and-forms/Commercial-operations/Shipping-safety/Fatigue-management/Fatigue-management-for-fishing-boats.pdf>

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Before Sailing

- Owners establish clear expectations
- Alternate plan if a crew member is not available
- Captain assess crew's fitness for duty



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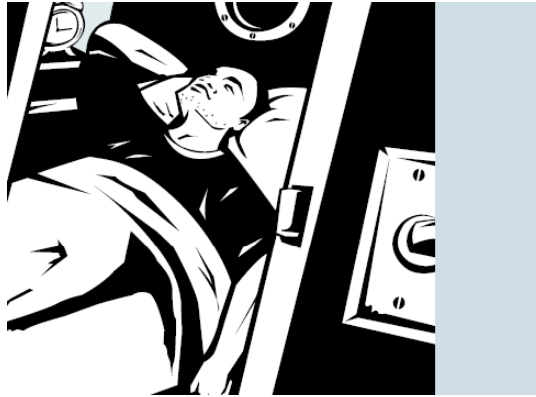
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<http://www.maritimenz.govt.nz/Publications-and-forms/Commercial-operations/Shipping-safety/Fatigue-management/Fatigue-management-for-fishing-boats.pdf>

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Sleep

- Good night sleep before sailing
- Encourage crew to bring sleep problem forward
- Sleeping environment allows quality of sleep



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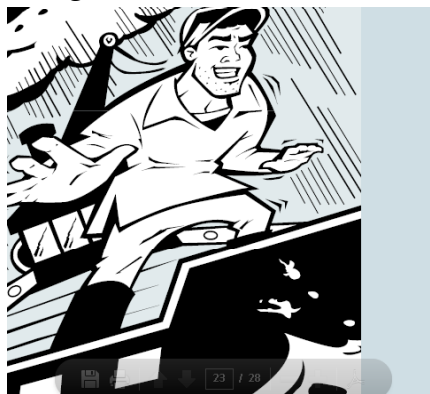
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Working Conditions

- Rest periods when required
- Discuss watch keeping practices
- Employ sufficient number of staff
- Monitor for fatigue



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<http://www.maritimenz.govt.nz/Publications-and-forms/Commercial-operations/Shipping-safety/Fatigue-management/Fatigue-management-for-fishing-boats.pdf>

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Managing Fatigue Risk

- Everyone assesses their activities
- Identify causes of fatigue
- Assess probability and consequences
- Establish measures to reduce the risk
- Assess effectiveness of measures



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Fishermen

Fishermen are the first to manage the risk of fatigue

- Do you sleep less than 7 hours?
- Is your sleep different during fishing season?
- Do you have trouble sleeping?
- Do you have any strategies to sleep well?
- Do you have any strategies to stay vigilant?
- Do you discuss fatigue with other crew member?



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Others

owners, associations, governments

- Decisions can influence how things are done
- Difficult to predict the impact of decisions on fatigue
- Develop practical strategies
- Communicate best practices



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Realities and Challenges to manage risk of fatigue

- Do not accept that fatigue is normal
- Work schedules
- Fish quantities and market price
- Smaller crew
- Less experienced crew member
- Day and night operation on a moving platform
- Weather conditions



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Références

<http://www.tc.gc.ca/fra/innovation/cdt-publication-tp13960f-13960f-602.htm>

http://www.saaq.gouv.qc.ca/lourds/fatigue_volant/index.php

<http://www.maritimenz.govt.nz/Publications-and-forms/Commercial-operations/Shipping-safety/Fatigue-management/Understanding-fatigue.pdf>

<http://www.fishsafe.org.nz/guidelines/docs/Safety-guidelines-for-small-commercial-fishing-vessels.pdf>

<http://www.imo.org/OurWork/HumanElement/VisionPrinciplesGoals/Documents/1014.pdf>

<http://www.maritimenz.govt.nz/Publications-and-forms/Commercial-operations/Shipping-safety/Fatigue-management/Fatigue-management-for-fishing-boats.pdf>

http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/BK44.pdf



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