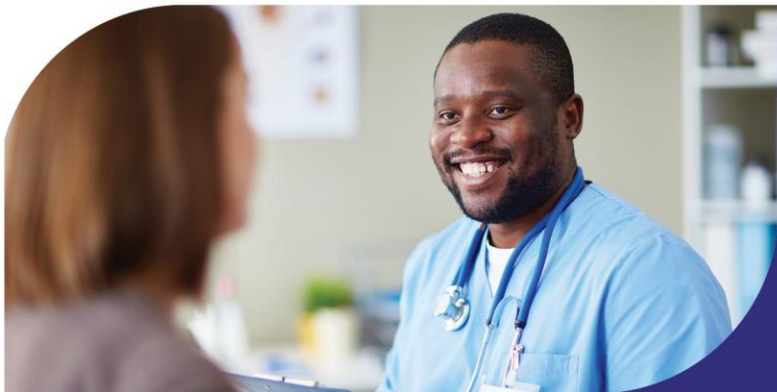




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Design Work for People: Ergonomics and Human Factors

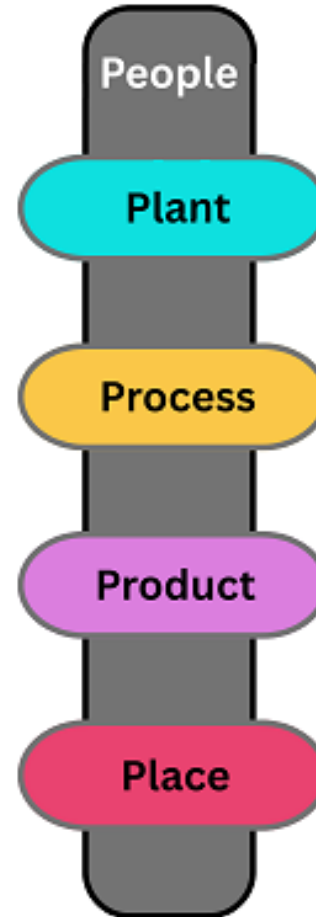


Colleen Butler, PhD., C.ErgHF MCIEHF
Human Factors Specialist/Inspector
3 December 2025

Design work for people being people

Abilities

Adapt to demands
Interpret procedures
Innovate
Detect and correct



Limitations

Memory
Attention
Decision making and
biases

Overview

Aim

Raise awareness of work-related fatigue

- sources of fatigue
- health and safety impacts
- good practice in fatigue risk management

Why does fatigue matter?

- Impacts on workers' health, and can increase risk of incidents
- Mental fatigue
 - not physical or emotional fatigue
- Increase in shift work
 - 15% in 2012
 - 23% in 2023 (CSO, 2024)
- Fatigue is not just due to shift work and night work
 - Long hours
 - Irregular hours

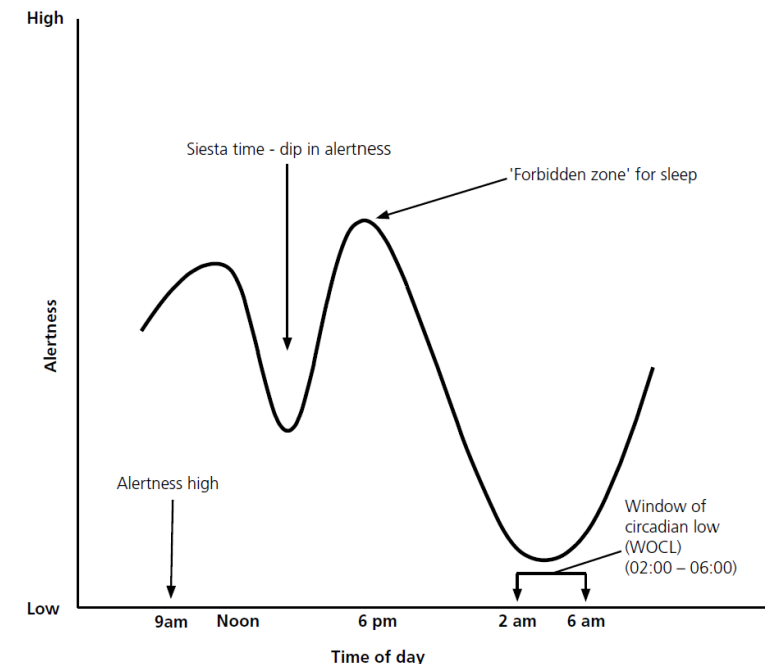


Impact on human reliability

- Fatigue-related impairment has been compared to impairment from alcohol
- The risk of errors, accidents and injuries has been found:

to be higher on the night shift;
to rise with increasing shift length over eight hours;
to increase over successive shifts, especially if they are night shifts;
to increase when there are not enough breaks.

[Example of research \(2019\) – Effects of shift work](#)



Energy Institute (2014) Managing fatigue using a FRMP

Fatigue....just being tired?

Fatigue is not just being tired. It results in a **significant reduction in mental and physical performance.**

It is caused by

- prolonged wakefulness
- sleep deprivation and/or
- excessive mental and physical workload







Fatigue signs and symptoms

- Poor judgement
- Memory lapses and lose of focus
- Low energy and motivation
- Slow reaction time
- Increased risk taking
- Irritability and mood changes

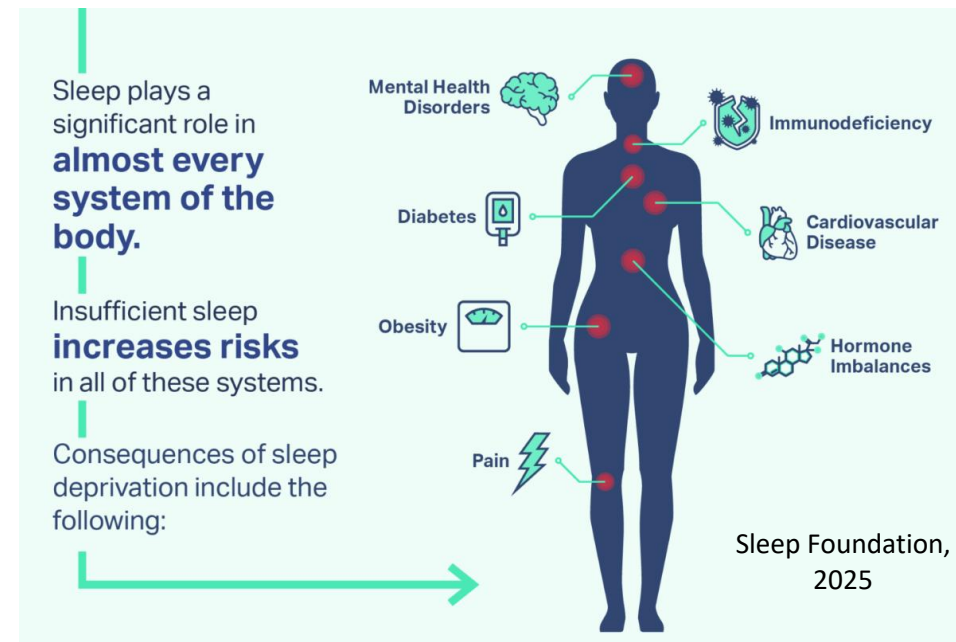


Impact of fatigue on safety

			
Lorry Driver	Control room operator	Ambulance Driver	Construction worker
Crossing central line Falling asleep at wheel	Difficulty concentrating Attention lapses	Judgement and decision making Harder to multi-task	Fatigue impacts on other hazards (e.g. Work at Height) Increased risk taking

Health impacts from night work and shift work

- Disruption of body clock > sleeping difficulties and fatigue
- Unclear evidence
 - associating long-term shift work, especially night work with increased risk for health conditions
 - that shift work exacerbates existing health conditions
- Shift workers and night workers may adopt less healthy lifestyles - impacts from poor diet and lack of exercise



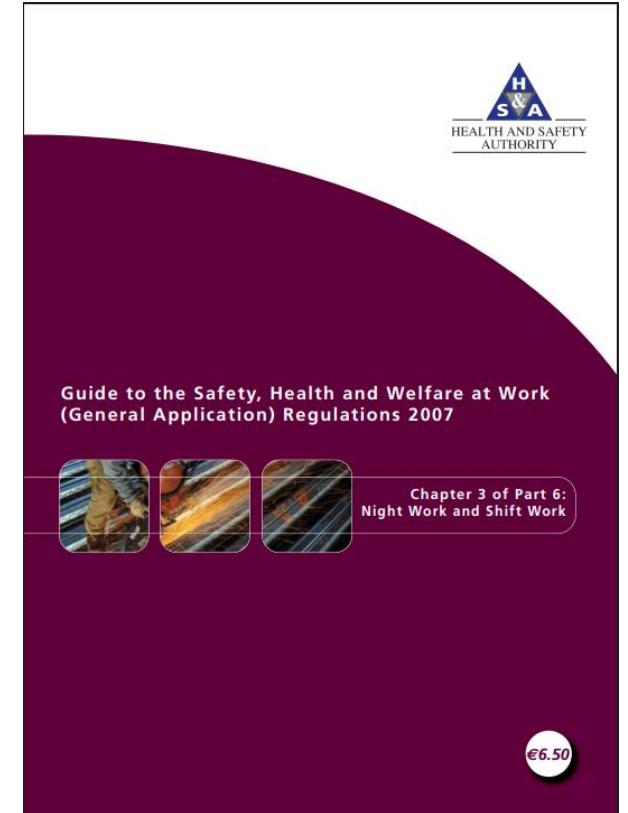
Legal duties

The Safety Health and Welfare at Work Act, 2005

- **Section 8, 2 (e):** Providing systems of work that are planned, organised, performed, maintained ...
- **Section 19 (1):** Every employer shall identify the hazards in the place of work under his or her control, assess the risks ...

The Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. 299/2007)

- Before an employee starts night work and at regular intervals whilst working as a night worker, the employer must offer the employee an assessment by a registered medical practitioner



[Guide to the Safety, Health and Welfare at Work \(General Application\) Regulations 2007: Chapter 3 of Part 6 Night Work and Shift Work.](#)

Assessing fatigue risk

Individual Factors

- Insufficient sleep quality and quantity (e.g. pregnant employees, older employees)
- Workers with health conditions
- New and temporary workers

Type of Work

- Physically or mentally demanding work
- Monotonous work (e.g. machine-pace)
- Work that requires constant attention

Organisational and Environmental Factors

- The design of shift work schedules
- Night work
- Long working hours
- Workplace environmental conditions (e.g. lighting, temperature).

Managing fatigue risk

Notice, talk, acknowledge:
Policy on fatigue

Design of **working**
hours

Awareness raising,
communication, **Occ health**

Reporting and
investigating

Other mitigation
measures

Fatigue-related
errors



Good practice in design of working hours/shift work

- **Start time** - Avoid early starts (i.e. before 7am)
- **Duration** – Plan a maximum of 12 hours in a shift
- **Rest Periods** – Plan a minimum of 11 hours rest between shifts. Plan a minimum of 2 night-time sleeps between shift changes
- **Breaks** – Promote short breaks of 5–15 minutes every 1 to 2 hours.
- **Workload** – Consider the mental and physical demand of work
- **Cumulative Fatigue** – Ensure appropriate limits on night and day shifts

[See HSA's Guidance for Employers and Employees on Night and Shift Work](#)

Awareness raising: The importance of sleep for health

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[Professor Matthew Walker: What happens to your brain and your body if you don't get sleep](#)

Sleep and your heart

[Irish Heart Foundation \(2023\)](#)

Myths and Facts About Sleep

[Sleep Foundation \(2025\)](#)

Fatigue reduction and fatigue proofing

	Fatigue reduction strategies	Fatigue proofing strategies
Organisational	<ul style="list-style-type: none">• Appropriate rostering• Appropriate working hours for tasks• Breaks• Competence in Fatigue management	<ul style="list-style-type: none">• Checklists• Rotation of tasks• Car-pooling• Provision of transport• Environment• Working in pairs• Supervision
Individual	<ul style="list-style-type: none">• Prioritisation of sleep• Fatigue awareness	<ul style="list-style-type: none">• Self-selected break times• Self-checklists• Self-reporting

Adapted from IPIECA: Managing Fatigue in the Workplace (2019)

Fatigue check-in tool

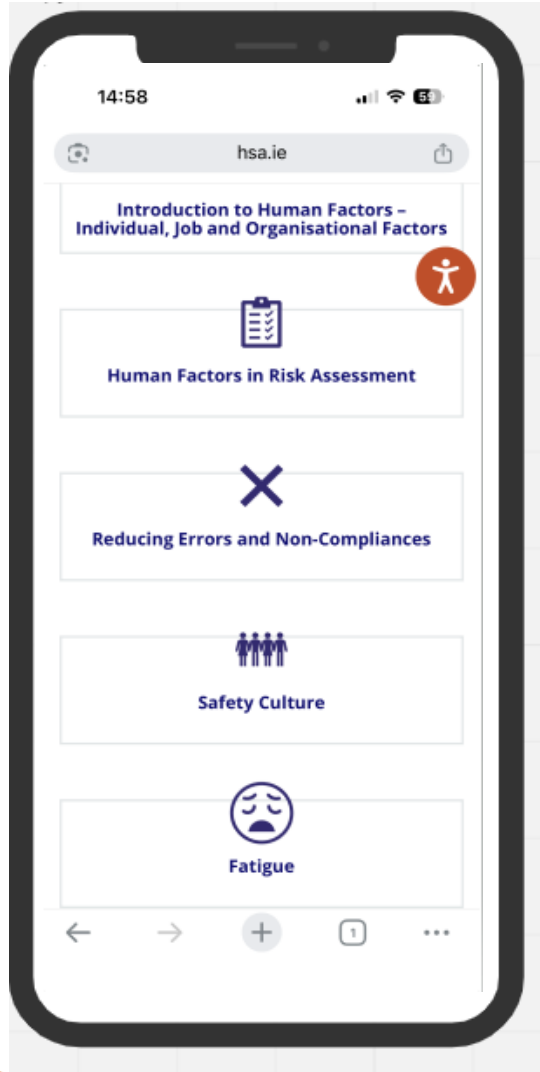
- Acknowledges fatigue in the workplace
- Raises awareness of who might need more support or provide support
- Opportunity to adjust ways of working

1	Extremely alert
2	Very alert
3	Alert
4	Rather alert
5	Neither alert nor sleepy
6	Some signs of sleepiness
7	Sleepy, but no effort to keep awake
8	Sleepy, some effort to keep awake
9	Extremely sleepy, great effort to keep awake, fighting sleep

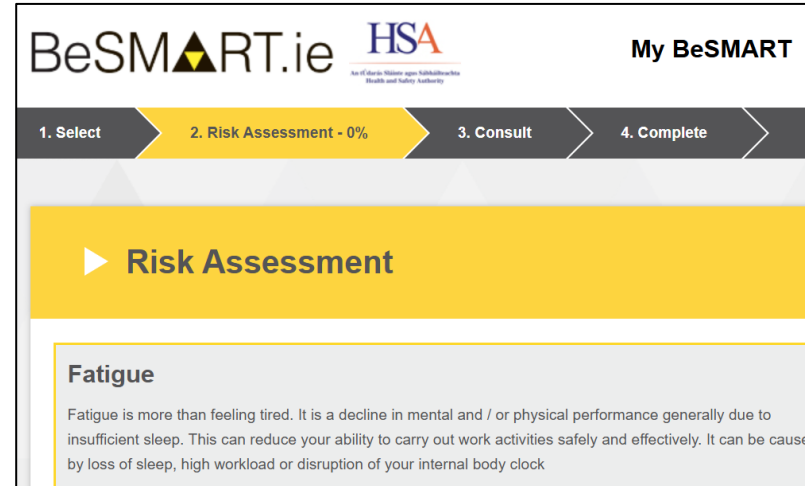
[Karolinska Sleepiness Scale: Adapted from Åkerstedt, 1990](#)

HSA resources and links

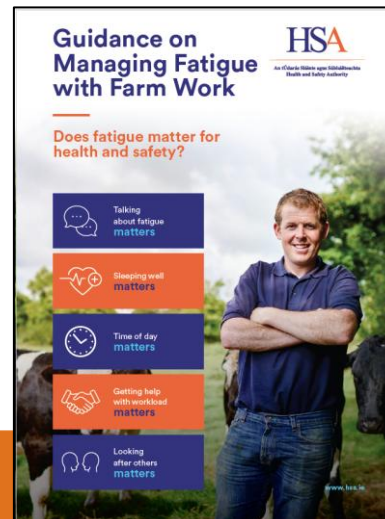
[HSA Human Factors](#)



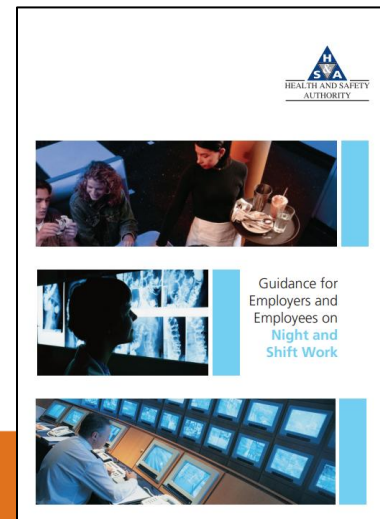
[HSA BeSmart](#)



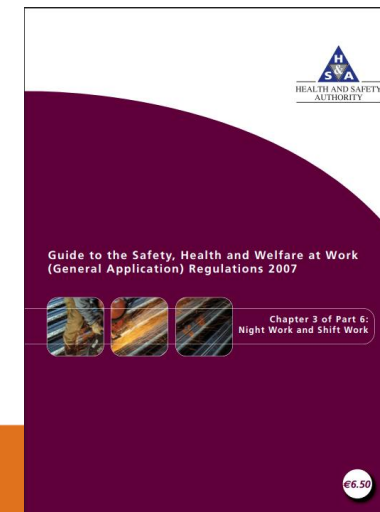
[Guidance on Managing Fatigue with Farm Work](#)



[HSA Night and Shift Work Guidance](#)



[HSA Guide: General Application Regulations Night and Shift Work](#)



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[HSA Human Factors e-learning](#)



[Research CATNAPS](#)



Key Messages

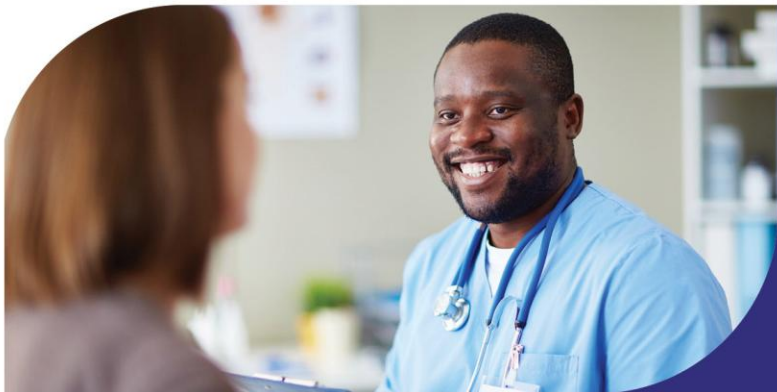
- Fatigue impacts safety and increases the risk of accidents, injuries and ill health.
- Acknowledge fatigue, **talk about fatigue** and **take action** on fatigue.
- Look beyond the individual – individual and organisational role.
- Risk Assessment (planned and dynamic)
 - Design of work hours
 - Education
 - Communication



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Go raibh maith agaibh
Thank you



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W: www.hsa.ie

Resources and References



An tÚdarás Sláinte agus Sábháilteachta
Health and Safety Authority

Energy Institute (2014) [Managing fatigue using a fatigue risk management plan](#), London

Health and Safety Authority (2024) [Guidance on Managing Fatigue with Farm Work](#)

Health and Safety Authority (2012) [Guidance for Employers and Employees on Night and Shift Work](#)

Health and Safety Executive (2006) [Managing shiftwork: Health and Safety Guidance](#)

La Trobe University (2024) [Rapid review on evidence of managing the risks associated with fatigue](#)

National Driver Licence Service (2024) [Obstructive Sleep Apnoea Syndrome and Driving](#)

Road Safety Authority [Driver Fatigue: The Facts](#)

Safe Work Australia (2025) [Managing the risk of fatigue at work: Code of Practice](#)