Centre of Maritime Health and Society

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Motion sickness among offshore wind farm workers

SDU

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Can you imagine doing this when you are seasick?

SDU

Research Objectives

1. To understand the significance of motion sickness in the wind industy

2. To understand if, and how it affects wind farm worker health beyond immediate/transient effects

3. To determine if there are any measures used to control motion sickness in the industry, and the impact of motion sickness on the sector

Scoping review

PRISMA based Scoping review of:

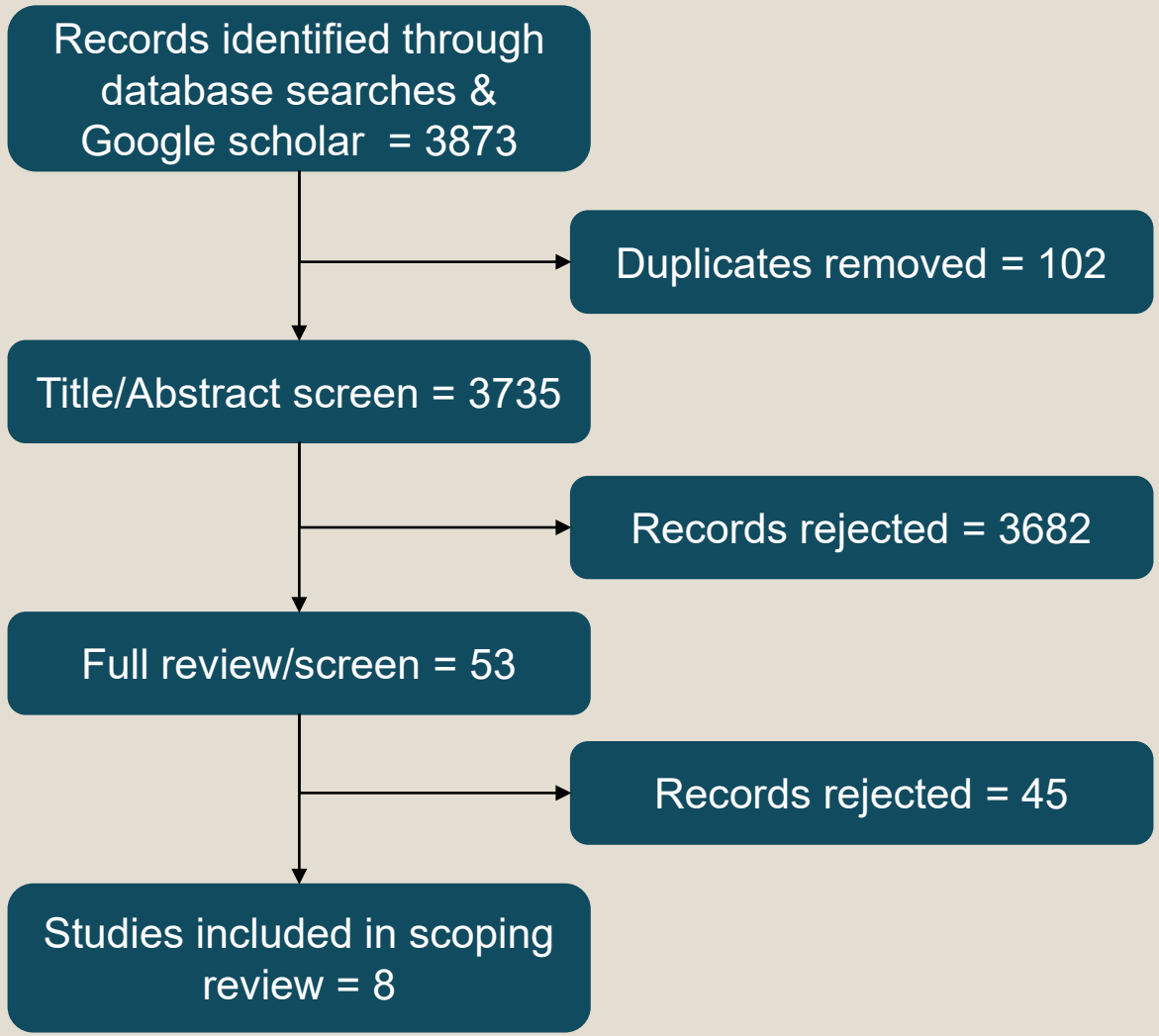
1. Pubmed
2. Scopus
3. Web of Science
4. Google Scholar

Search terms:

Motion sickness **OR** seasickness
AND
Wind farm **OR** offshore wind farm

Search terms translated from PubMed using **Polyglot Search:**

https://sr-accelerator.com/#/polyglot



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Scoping Review Findings

- Wind farm work is strenuous work with significant job demands
  - Load carrying
  - Climbing
  - Heat/cold stress
  - Psychologically challenging e.g., crew transfer
  - Awkward body postures
  - Mentally demanding tasks - requiring concentration and clarity of thought
  - High accident risk
  - Moving environment

Motion sickness is a significant job demand for those wind farm workers affected.

Scoping Review Findings

There is comparatively little research concerning motion sickness in offshore wind farms.

Seasickness appears to be an issue for many; however:

- Records of prevalence are not available
- There appears to be underreporting/recording, we do not know why

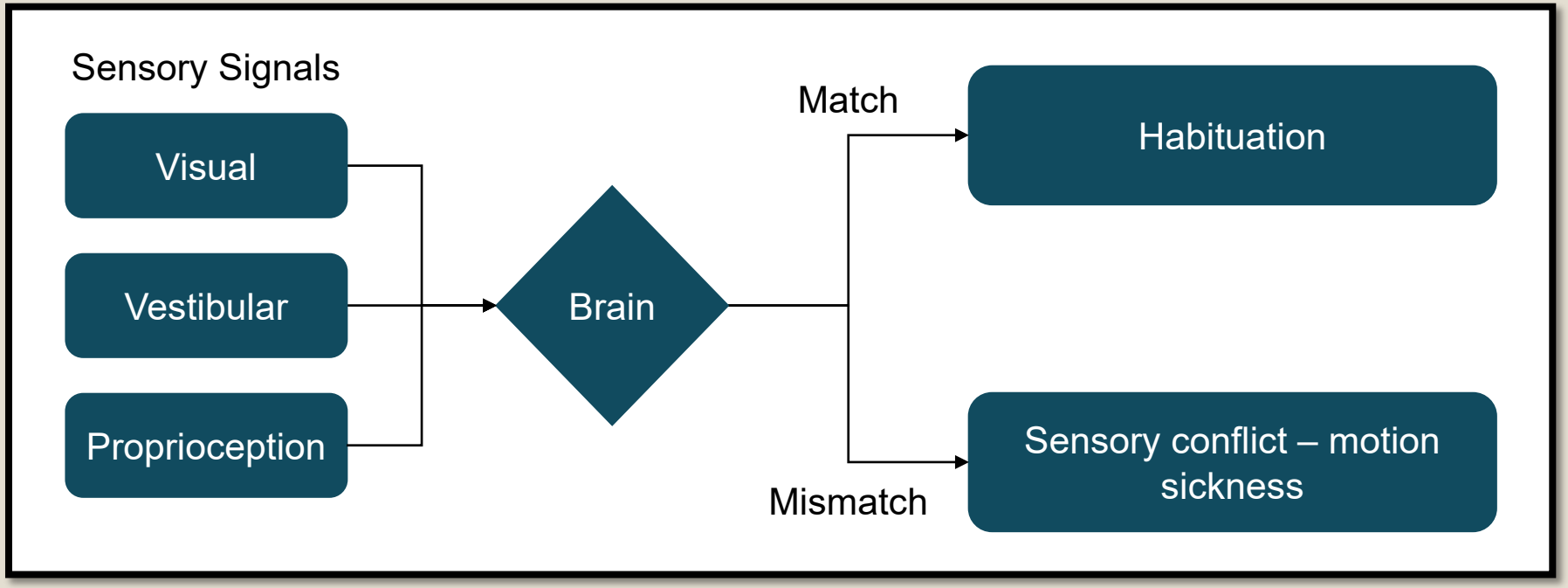
Wind farm work can be considered strenuous work, with significant job demands and high risk of accident which is not improved by motion sickness

Current research:

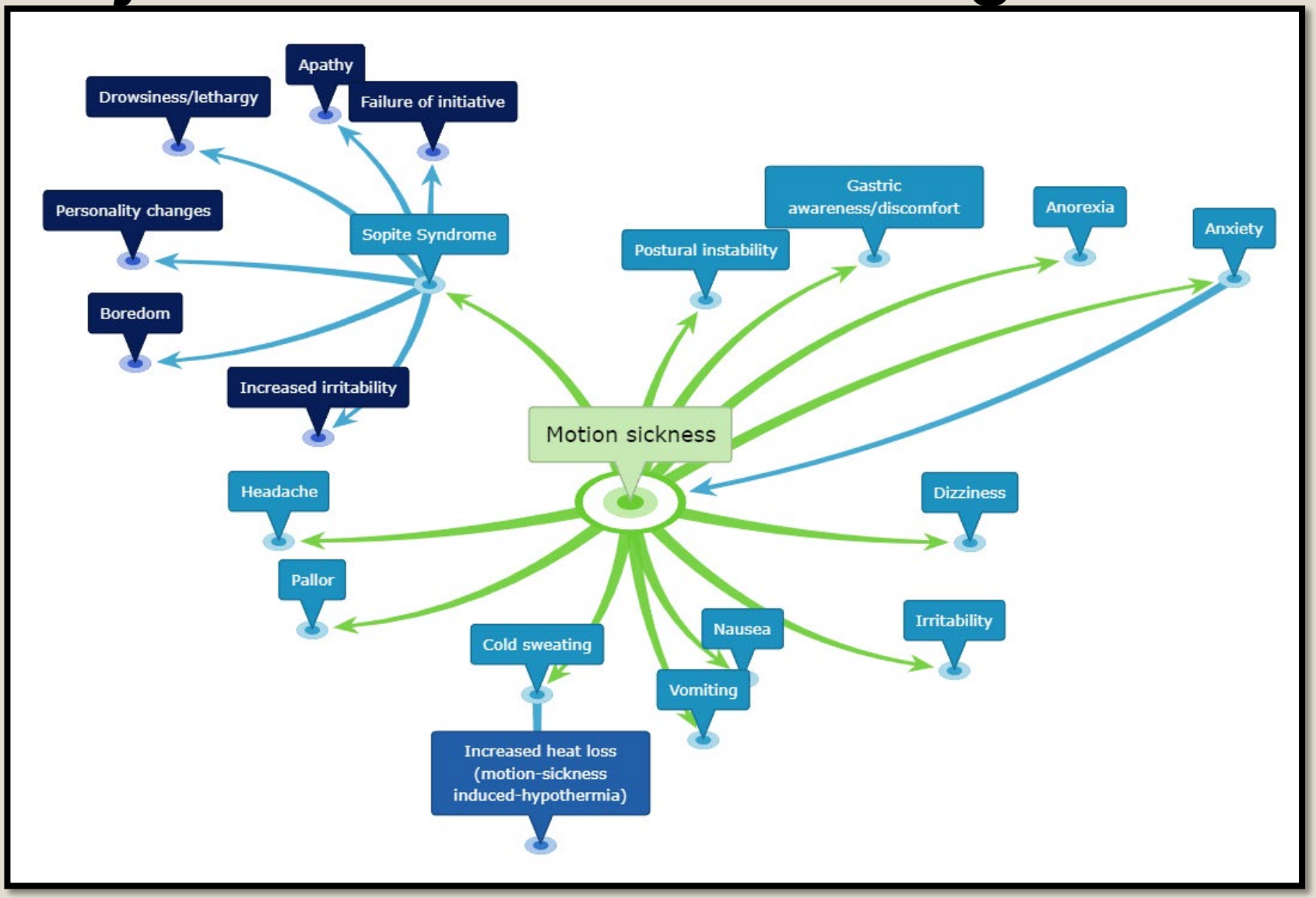
- Does not elaborate on motion sickness as a workplace exposure
- Focuses primarily on the logistics of transfer, not necessarily wellbeing
- Does not elaborate on the health issues of motion sickness
- Does not look at crew attrition/retention rates
- Does not currently consider motion sickness induced in the nacelle

Theoretical Background

The current, broadly applied theory of motion sickness is that of sensory conflict/neural mismatch [1].



More than just nausea and vomiting



Varying susceptibility

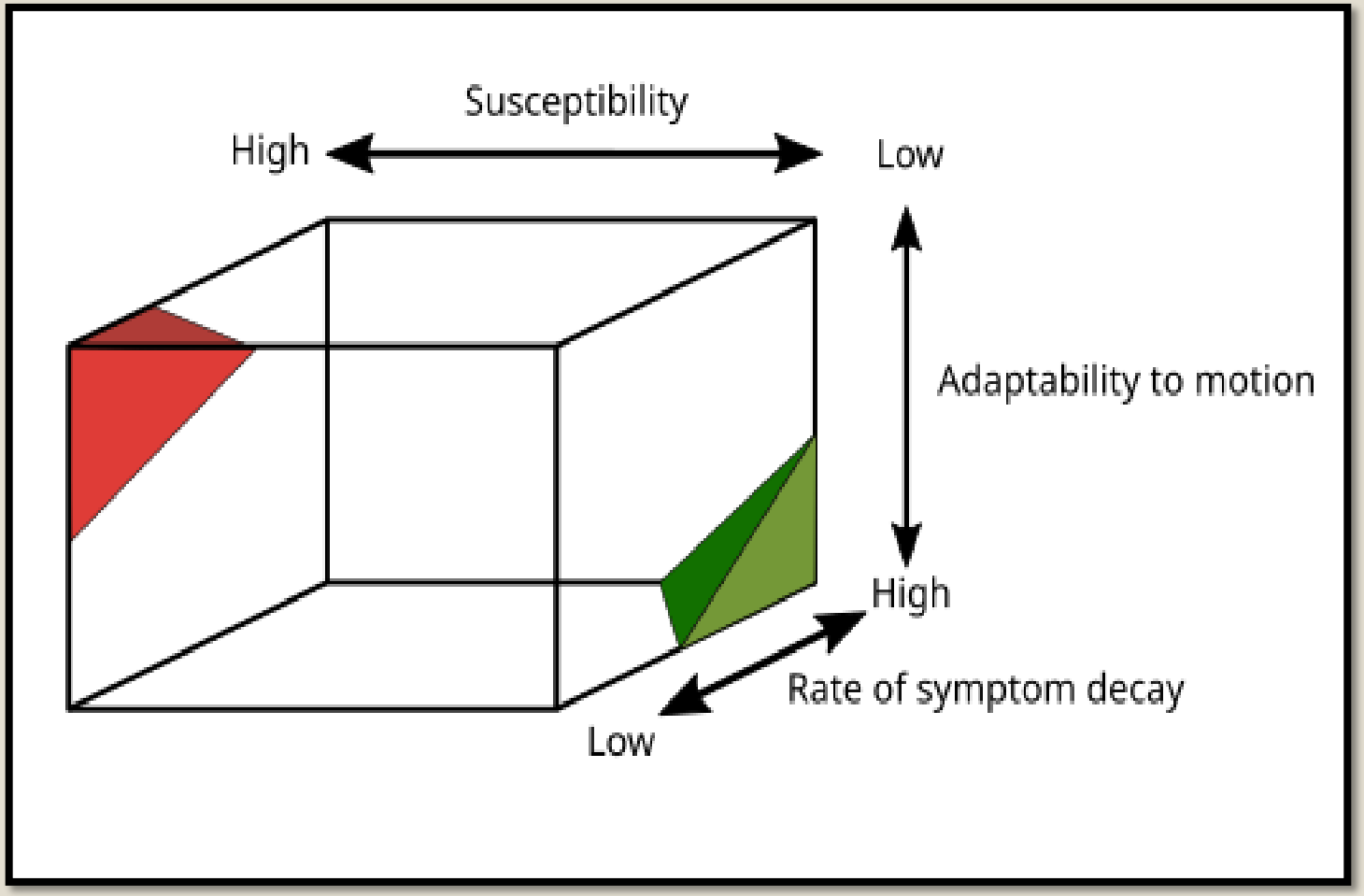
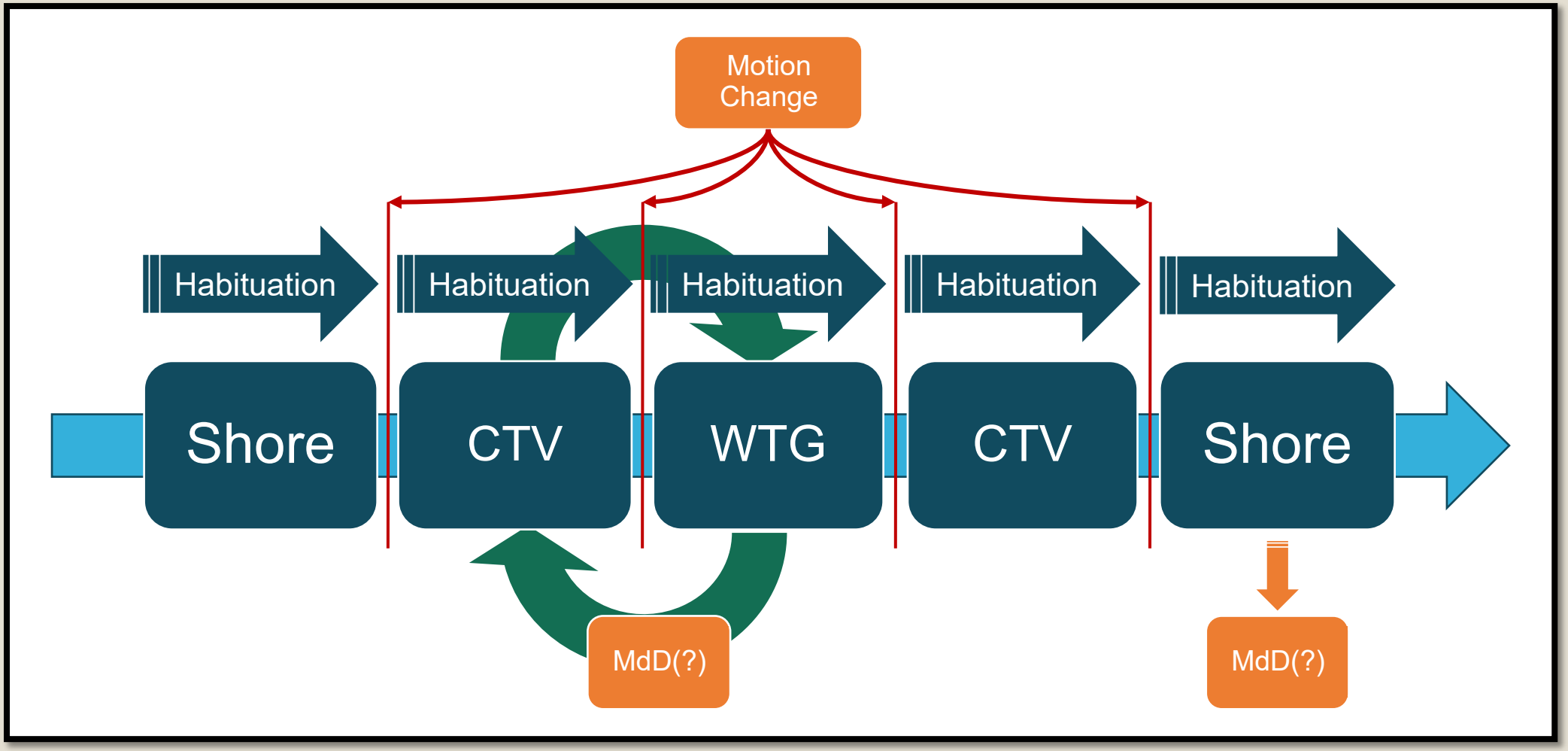


Illustration by Fenn, A., adapted from Lackner, 2014 [3].

A changing motion environment



An Occupational Exposure

A question:
In what other circumstances would a workforce be exposed to an agent that leads to:

- Vomiting
- Nausea
- Malaise
- Incapacity

which is not reported, or recorded; and still be expected to function in a high-risk environment?

Future wind energy, future motion sickness?

Far from shore wind farms will increasingly consist of Floating Offshore Wind Turbines (FOWTs), these may bring issues of motion sickness due to:

- Greater transit times – greater motion exposure
- Areas of higher wind – higher seastates - greater motion exposure
- Far from shore – higher seastates (fetch) - greater motion exposure
- Reduced access due to movement of FOWTs, making access more difficult and limiting possibilities, therefore transfer may occur in more marginal conditions
- Possible increased rate of motion sickness when working in the hub due to FOWT motion

Further motion sickness research is needed.

- An accurate prevalence rate needs be determined as a baseline.
- Workers should be surveyed to understand issues and needs, barriers, enablers.
- Research is needed; particularly in connection with floating wind turbines, and taller fixed structures where nacelle motion may be an issue.
- How many people leave the industry due to vessel motion? What cost does that impart?

References

[1] Reason, J. T. and J. J. Brand (1975). Motion sickness. Oxford, England, Academic Press.

[2] Mette, J., Velasco Garrido, M., Harth, V., Preisser, A. M., & Mache, S. (2018). Healthy offshore workforce? A qualitative study on offshore wind employees' occupational strain, health, and coping. *BMC Public Health, 18(1), 172.*

[3] Lackner, J. R. (2014). "Motion sickness: more than nausea and vomiting." Exp Brain Res **232(8): 2493-2510.**

[4] Bahji, A., Kasurak, E., Sterling, M., & Good, L. (2021). Misuse and dependence of dimenhydrinate: A mixed studies systematic review. *J Psychiatr Res, 136, 581-588. https://doi.org/10.1016/j.jpsychires.2020.10.032*

[5] Schifano, F., Chiappini, S., Miuli, A., Mosca, A., Santovito, M. C., Corkery, J. M., Guirguis, A., Pettorruso, M., Di Giannantonio, M., & Martinotti, G. (2021). Focus on Over-the-Counter Drugs' Misuse: A Systematic Review on Antihistamines, Cough Medicines, and Decongestants. *Front Psychiatry, 12, 657397. https://doi.org/10.3389/fpsyt.2021.657397 https://doi.org/10.1186/s12889-018-5079-4*

[6] Levy, B., & Roelofs, C. (2019, February 25). Impacts of Climate Change on Workers' Health and Safety. *Oxford Research Encyclopedia of Global Public Health.* Retrieved 26 Sep. 2023, from https://oxfordre.com/publichealth/view/10.1093/acrefore/9780190632366.001.0001/acrefore-9780190632366-e-39.

Supplementary Slides

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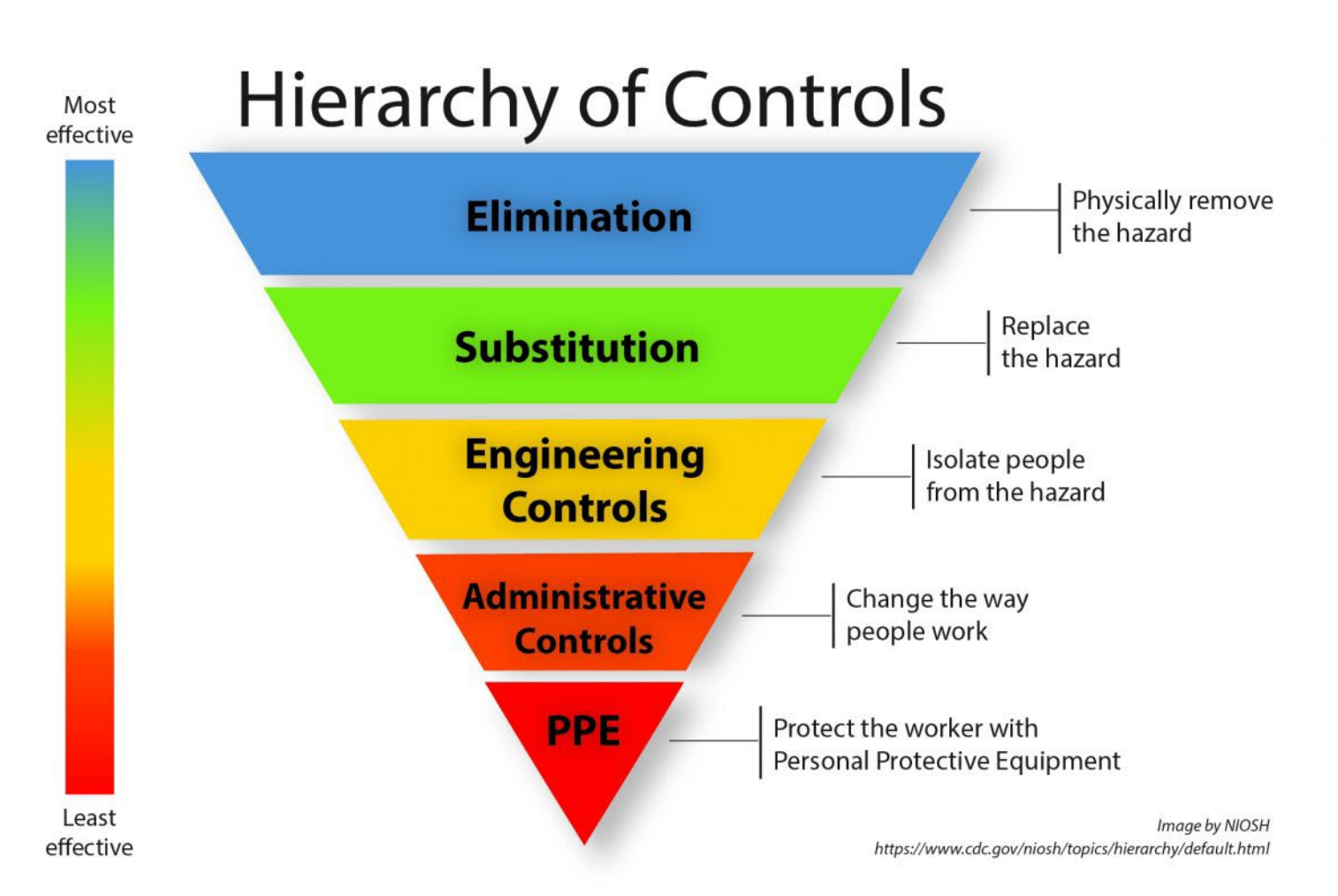
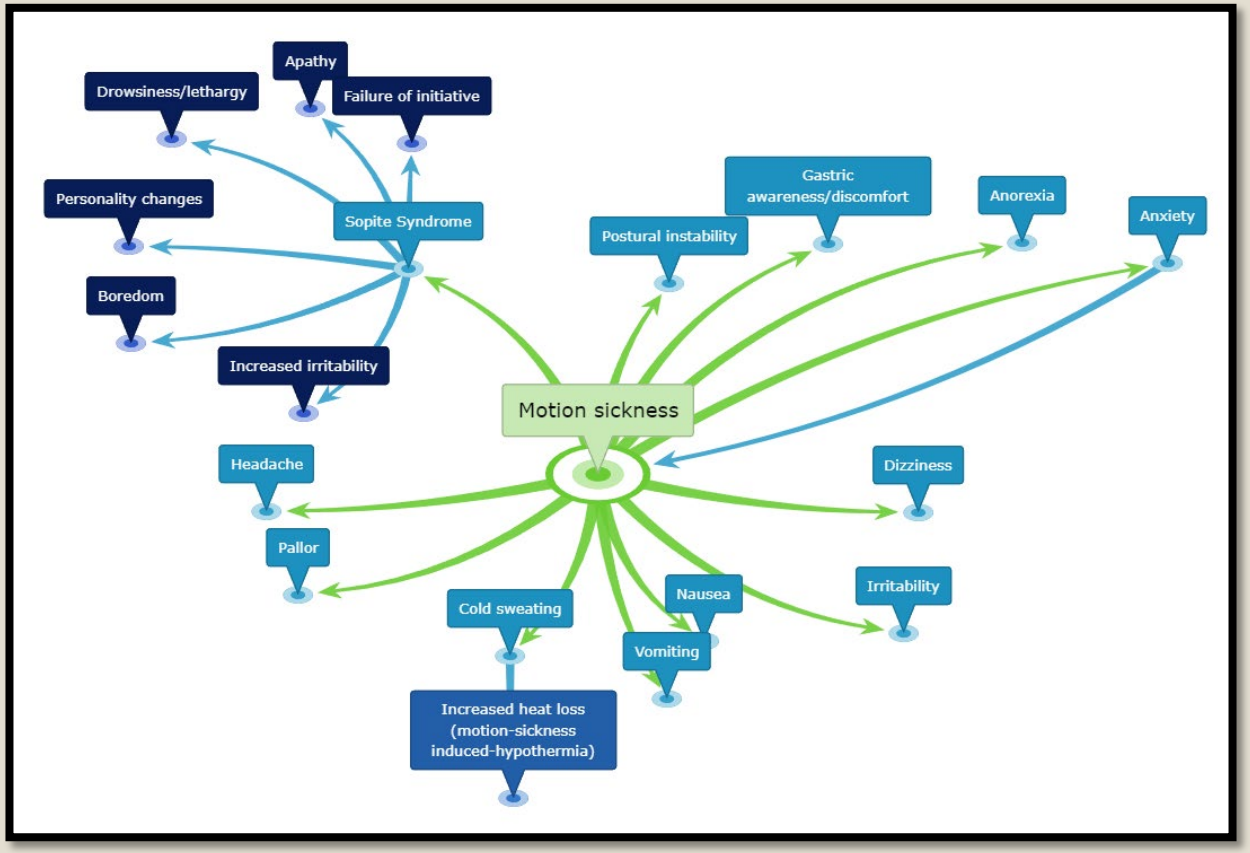
Hierarchy of Controls



Why not use medication?

Medication listed side-effects:

- Drowsiness
- Headache
- New or worsening dizziness
- Blurred vision
- Ringing in the ears
- Dry mouth, nose, or throat
- Problems with coordination
- Fainting
- Dizziness
- Nausea
- Fast, pounding, or irregular heartbeat



Example = Dimenhydrinate: MedlinePlus Drug Information