Fatigue: Detection and Recovery

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Objectives

- Develop awareness of fatigue symptoms
- Understand impact of fatigue
- Develop strategies to manage and recover from fatigue

Introducing Fatigue

- The Number 1 Enemy of Reliability
- Related to but not identical with sleep deprivation

Let's Talk About the Brain

- Uses 20% of energy of the body
- Can metabolize both fats and blood sugar
- Energy is mostly stored as ATP
- Energy usage generates waste
- Has receptors to detect waste

Getting Nutrients In and Waste Out

- Brain is surrounded by fluid (CSF)
- Fluid circulates
- Moves from arteries to lymph collection sites
- Carries out wastes including adenosine and amyloid proteins

Introducing the Glymphatic System

- Discovered in 2011
- Channels for CSF to flow
- Most active when we are asleep
- Critical in understanding sleep debt and deficiency
- Sleep deprivation leaves excess waste buildup in the brain
- Increased susceptibility to Mental Fatigue

Induced Mental Fatigue

- Increased susceptibility from sleep interruption or deprivation
- High cognitive load can induce in all cases
- Cognitive load includes perceptual load, processing, and task load
- Stress can increase cognitive load and hence fatigue
- Results from local waste buildup and/pr energy exhaustion in the brain
- Can be measured on an EEG

Management of Minor Fatigue

- Caffeine
- Taking a break
- Listening to music

Management of Major Fatigue

- Take a long break
- Get sleep

By the time it gets to this point, you have few options

Exercise Part 1

`https://www.archimedes-lab.org/Stroop_test.html` Pairs, 2 min then 2 min, then switch 2 min then two min

Observations

Compare first and second 2 minutes

- What happened to number of successes?
- What happened to number of failures?

Discussion of exercise results