



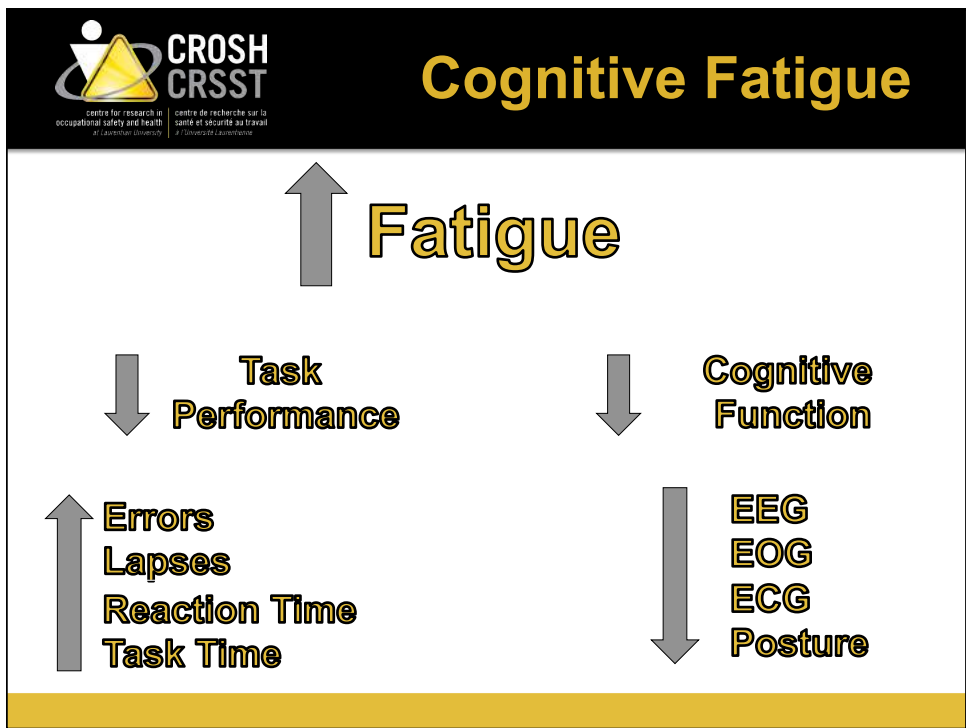
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Fatigue Monitoring & Mitigation: Technologies & Techniques

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CROSH Fatigue Conference 2016






Detecting Fatigue

Psychomotor vigilance test

- Evaluates alertness
- Measures RT to varied stimulus
- Portable apps available



Surveys/self report


- Sleep Quality
- Sleepiness

A.Z. Stanford Sleepiness Scale


| Score | Subjective feeling of alertness |
|-------|--|
| 1 | Feeling active and vital; alert; wide-awake. |
| 2 | Functioning at a high level, but not at peak; able to concentrate. |
| 3 | Relaxed; awake; not at full alertness; responsive. |
| 4 | A little foggy; not at peak; let down. |
| 5 | Fogginess; beginning to lose interest in remaining awake; slowed down. |
| 6 | Sleepiness; prefer to be lying down; fighting sleep; woozy. |
| 7 | Almost in reverie; sleep onset soon; lost struggle to remain awake. |


Pupilometry Test

- Measures diameter of pupil and dilating speed



Sleep Monitoring Devices






Monitoring Fatigue in Driving Applications

Electroencephalography (EEG)

- Monitors brain waves linked to drowsiness and sleep (theta, delta, alpha)
- Alerts user of fatigue level




Head Monitoring

- Monitors head position with gyroscopic sensors
- NapZapper had many false positives




Electrooculography (EOG)

- Monitoring eyelid movements
- IR sensors
- Algorithms to improve understanding



Position Monitoring

- Monitors vehicle position
- Alarms user when lane or path deviations occur
- Reactive system





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Formal, Low Tech Fatigue-Proofing Strategies









Based on the work of Dawson (2012)



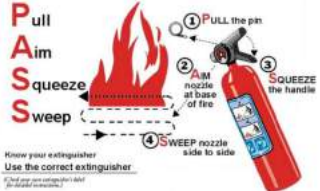
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Informal, Low Tech Fatigue-Proofing Strategies





To operate an extinguisher:

Pull
Aim
Squeeze
Sweep



Know your extinguisher!
Use the correct extinguisher.
© 2007 Fire Department of the City of Toronto



Based on the work of Dawson (2012, 2015a,b) and Naweer et al. 2015



Questions

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