



UNIVERSITY OF
AUCKLAND
Waipapa Taumata Rau
NEW ZEALAND

Neurophysiological monitoring of diving injuries

Dr. Xavier Vrijdag

March 21st, 2024

Extreme physiology

- Gas narcosis
- Hypoxia
- Hyperoxia
- Hypercapnia
- HPNS
- Hypothermia

All of these affect the brain, but it is the organ that we don't monitor.



Neuromonitoring techniques

- EEG
- fNIRS
- Eye-tracking
- Electrical dermal activity
- Physiological monitoring
- Combination of modalities



Real-time analysis

- Clean data collection
- Robust data selection
- Processing power constraints

Feature extraction

- Complex signals
- Small effects
- Machine learning

Diver warning system

- Body Area Network
- Diver interface
- Warning to other divers
- Warning to underwater vehicle
- Warning to dive supervisor





Neuromodulation

- Electrical
- Magnetic
- Drugs



UNIVERSITY OF
AUCKLAND
Waipapa Taumata Rau
NEW ZEALAND

Thank you