Sleep while sailing solo offshore – tips and considerations

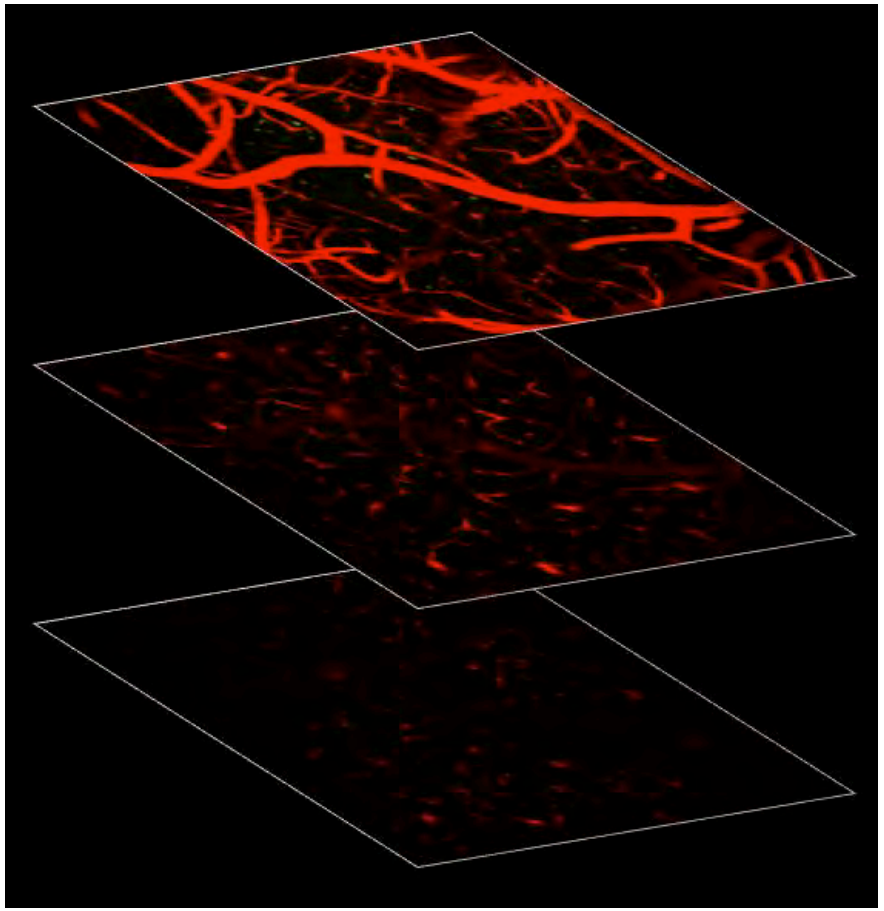
Phil Haydon, Ph.D.

Annetta and Gustav Professor and Chair of Neuroscience

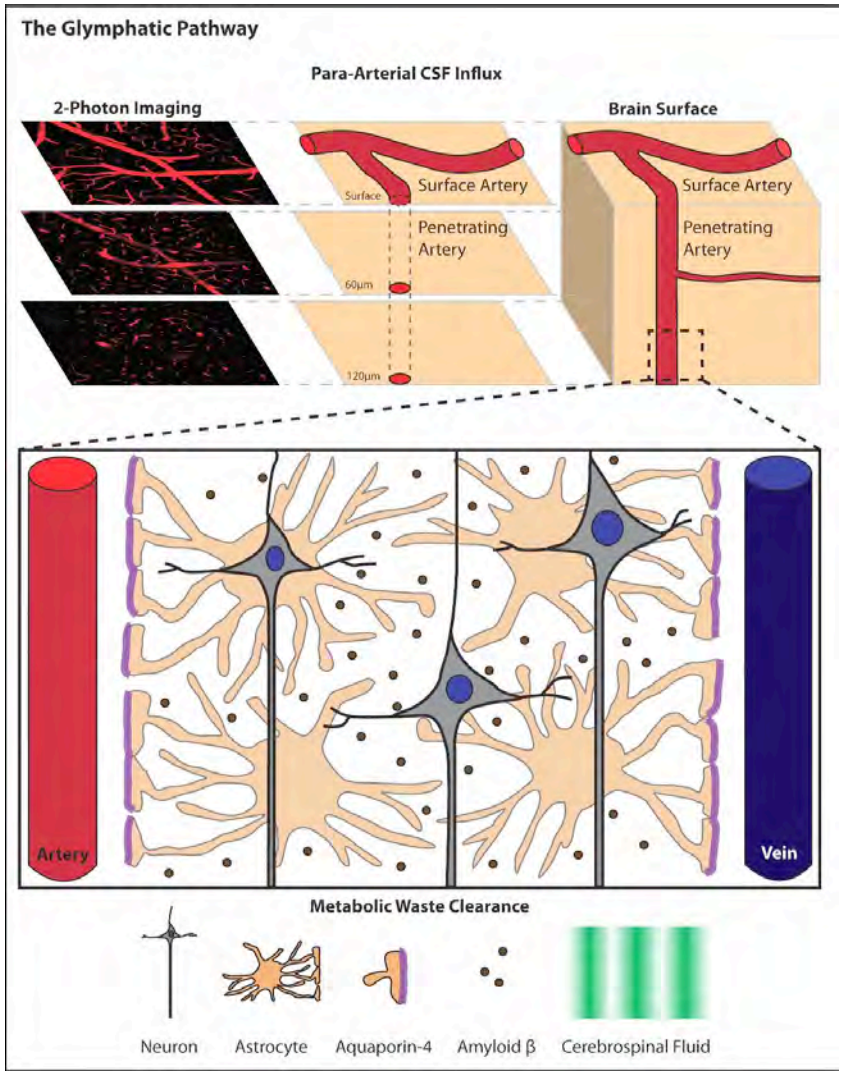
Tufts University School of Medicine

Newport Yacht Club - November 2nd 2019 – philip.haydon@gmail.com

Sleep activates the brain flush to clear toxins



Nedergard lab 2012



"The willingness of NASA employees in general to work excessive hours, while admirable, raises serious questions when it jeopardizes job performance, particularly when critical management decisions are at stake."

.....certain managers involved in the launch had only slept two hours before arriving to work at 1 a.m. that morning.

....."The willingness of NASA employees in general to work excessive hours, while admirable, raises serious questions when it jeopardizes job performance, particularly when critical management decisions are at stake."

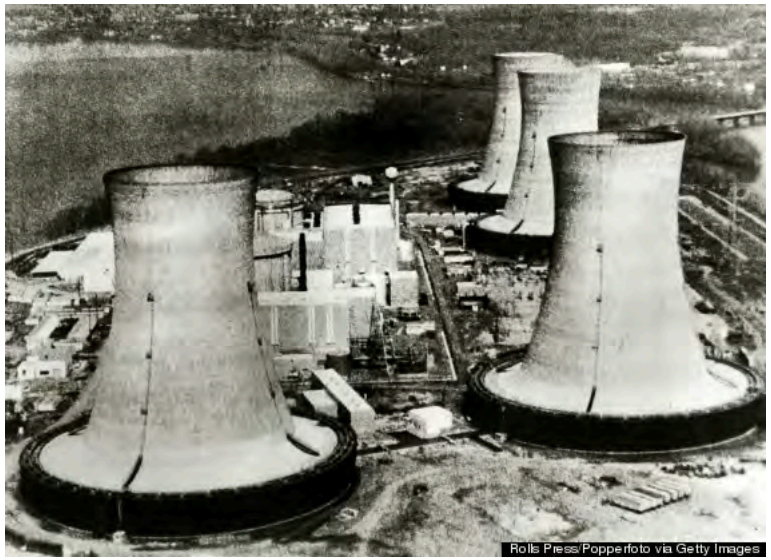
Exxon Valdez: Gregory Cousins was allegedly sleeping at the helm,

- …..Gregory Cousins was allegedly sleeping at the helm, leaving him unable to turn the boat back into the shipping lanes in time to avoid disaster. The crew had just put in a 22-hour shift loading the oil onto the ship, the Anchorage Daily News reported, and Cousins had reportedly only had a "catnap" in the last 16 hours leading up to the crash.

Air France Flight 447 was a routine passenger flight that left Rio de Janeiro and headed for Paris on June 1, 2009. Four hours later, the plane crashed, killing everyone aboard.

- …..the captain had slept only one hour the night before the flight and the two copilots were not any better off.
- …the captain decided to take a nap in a bunk behind the cockpit. The nap was scheduled, and everything should have been fine.
- But when the flight ran into a band of thunderstorms and turbulence soon afterward, it took the captain over a minute to get back to the cockpit. The tired copilots overcorrected when sensors iced over and the autopilot disengaged. They took the aircraft rapidly from 11,000 meters (36,000 ft) to 11,600 meters (38,000 ft) before it stalled.[5] By the time the captain reached the cockpit, it was too late ….

Three Mile Island



Chernobyl

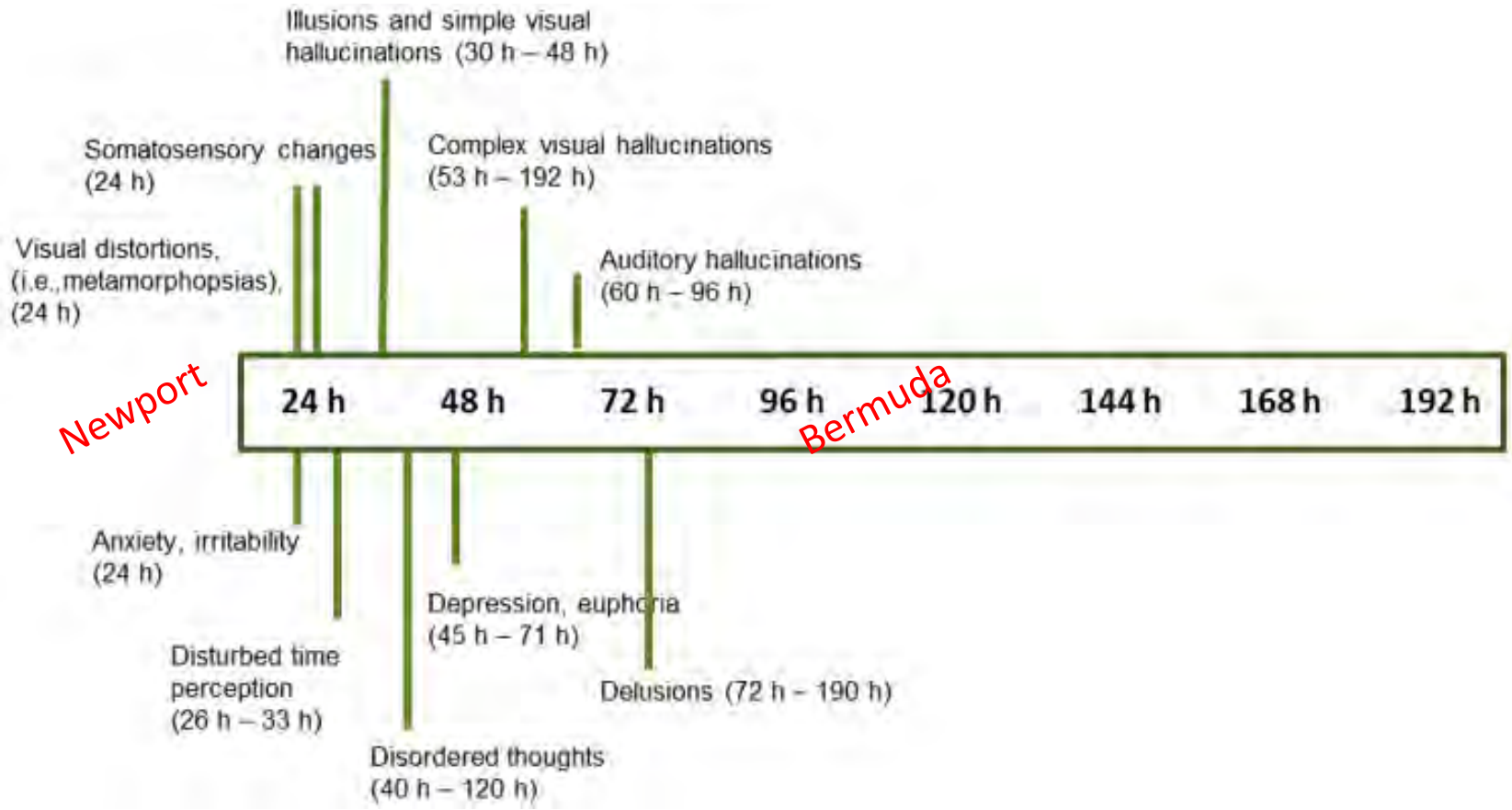
- In the 1994 BOC Around the World race, the French sailor Jean Luc Van Den Heede fell asleep at the helm and woke half an hour later having run aground on the only stretch of sand for miles on the south-western coast of Australia. With the help of local people, he managed to refloated the vessel and continue the race.

- In 1990, Desmond Hampton was less fortunate, smashing Sir Francis Chichester's Gypsy Moth V into rocks while sleeping.

- At its extreme, sleep loss can cause hallucinations and solo sailors have been convinced that other crew were on board helping them out.

And of course, more recently

Consequences of sustained sleep loss



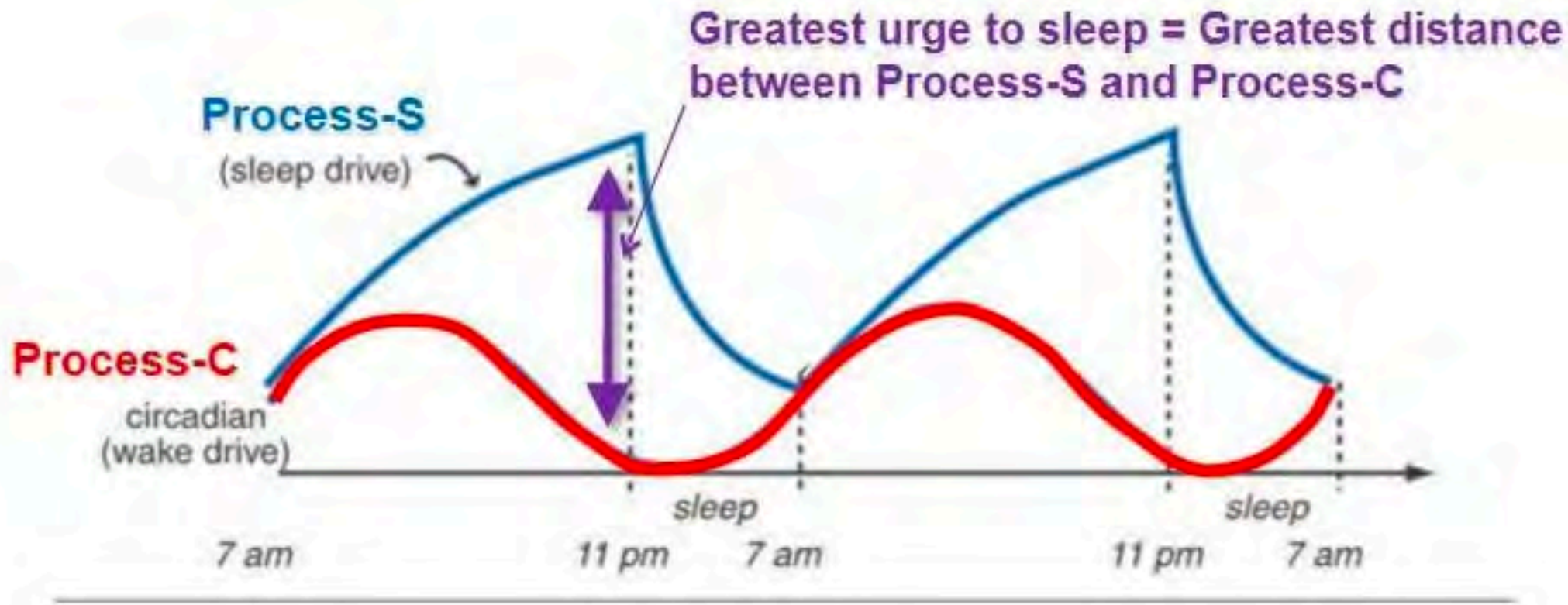
Waters et al., 2018

Hallucinations are real, too real

- The young racer had been sailing for days without sleep, but he was ahead of the fleet in the Solitaire du Figaro, a grueling, singlehanded race off the coast of France. Sailing into the harbor to the cheers of the crowd, he stepped from his boat onto the wharf to accept their congratulations


Sleep Stages Through The Night
Awake
REM
1
2
3
4
Stage of Sleep
0
1
2
3
4
5
6
7
8
Time From Sleep Onset
(Hours)
Non-REM Sleep
REM Sleep

Wakefulness is controlled by circadian and homeostatic processes



Sleepjunkies.com

Polyphasic sleep – Claudio Stampii

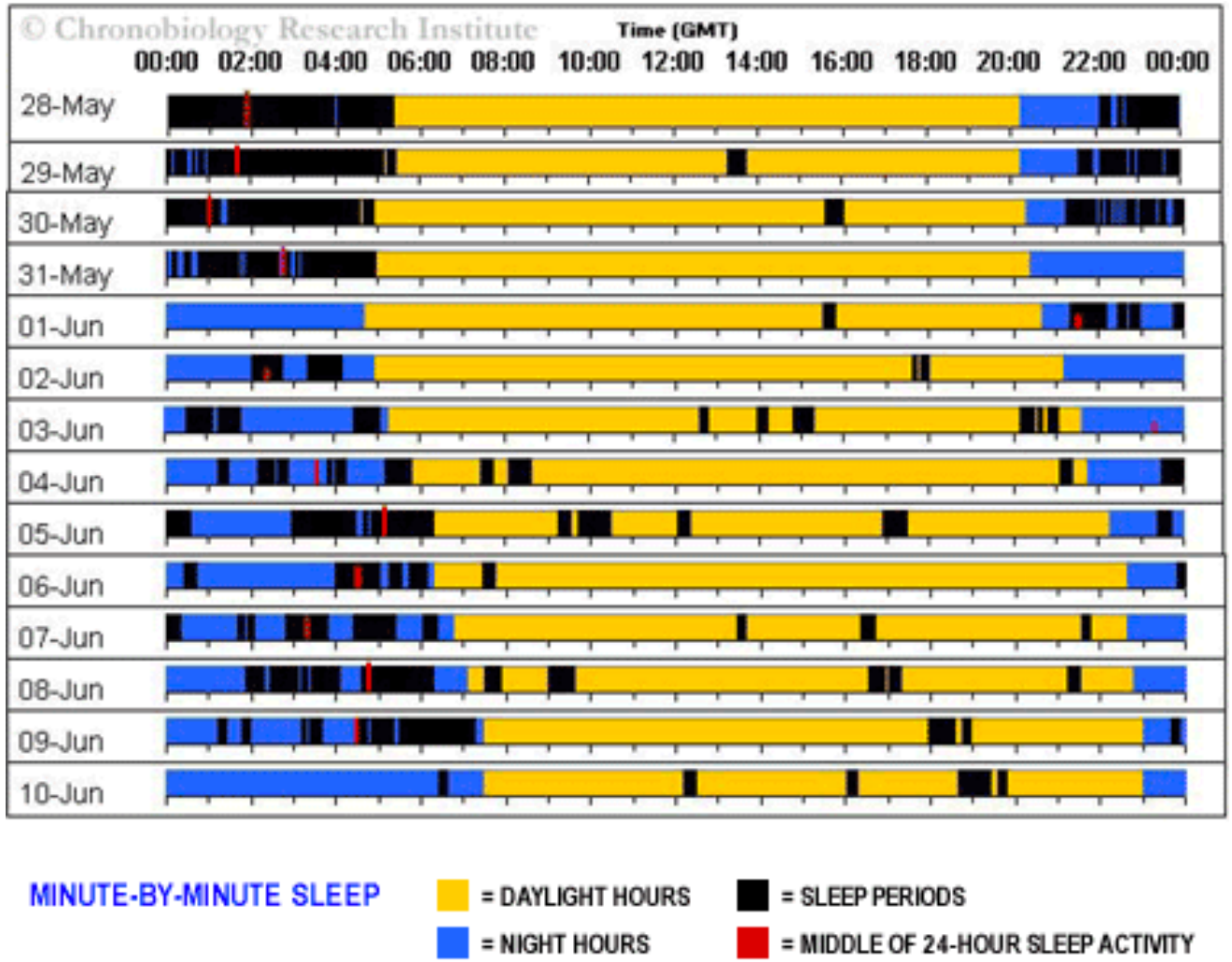
- Monophasic sleep – sleeping through the night
- Biphasic sleep – 5-6h at night with a short nap in the daytime
- Polyphasic sleep – short naps spread out through the 24h day

- Italian neurologist Claudio Stampi began to look into the benefits of polyphasic schedules. He noticed his fellow sailor sleepers adopting altered sleep without much difficulty and with many upsides. For one of Stampi's experiments he observed Francesco Jost, a Swiss artist, practicing polyphasic sleep for 49 days at his home. After the initial shock to his body, Jost's concentration and mood stayed relatively consistent, **though he had trouble waking up at times**.

Rich Wilson's Sleep Patterns Prior to and During the Transat Race on GAII

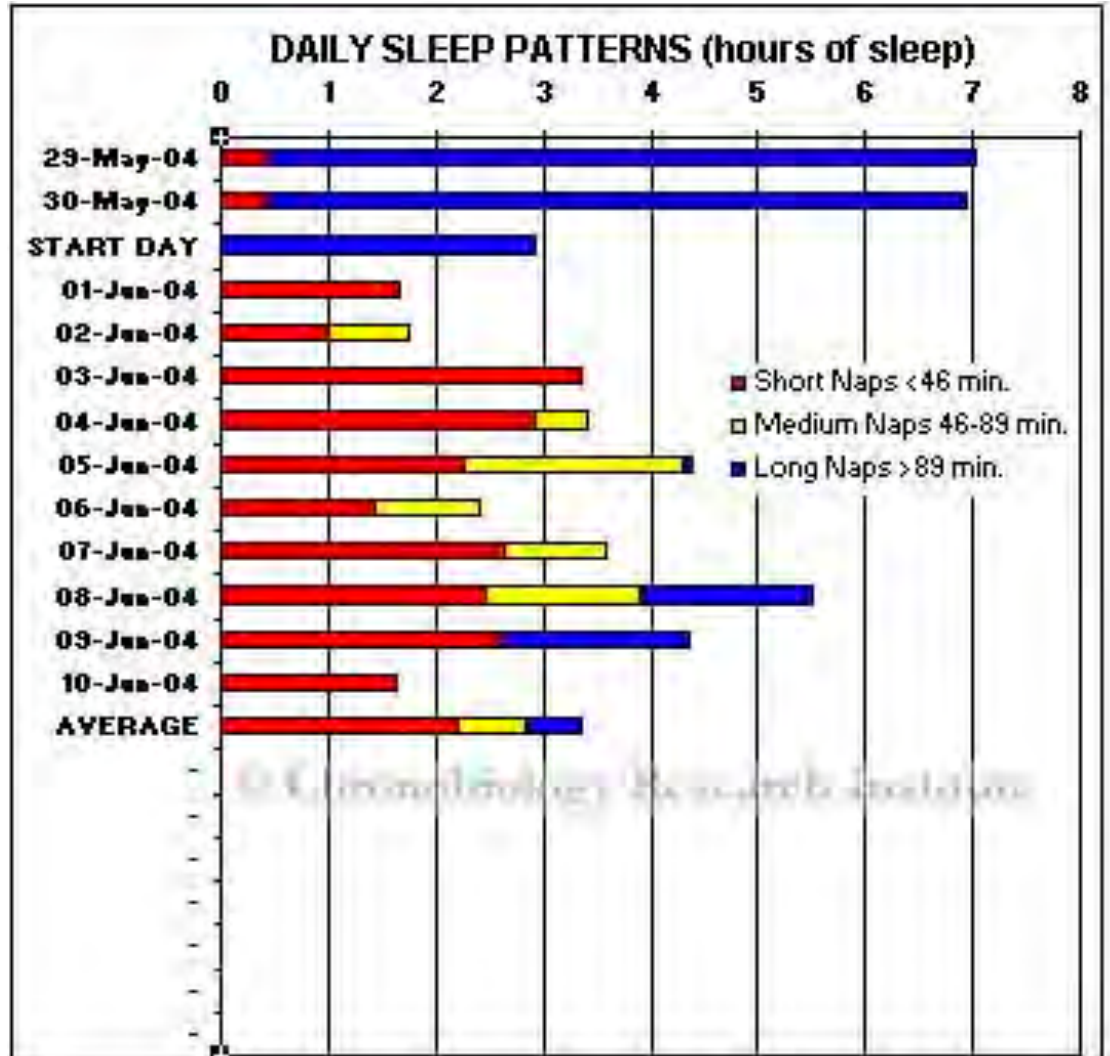
By Dr. Claudio Stampi, MD, PhD.

Chronobiology Reseach Institute, Boston, Massachusetts—June 12, 2004



Race start/halyard issue

Clustered naps in pm


DAILY SLEEP PATTERNS (hours of sleep)
0
1
2
3
4
5
6
7
8
29-May-04
30-May-04
START DAY
01-Jun-04
02-Jun-04
03-Jun-04
04-Jun-04
05-Jun-04
06-Jun-04
07-Jun-04
08-Jun-04
09-Jun-04
10-Jun-04
AVERAGE
Short Naps < 46 min.
Medium Naps 46-89 min.
Long Naps > 89 min.

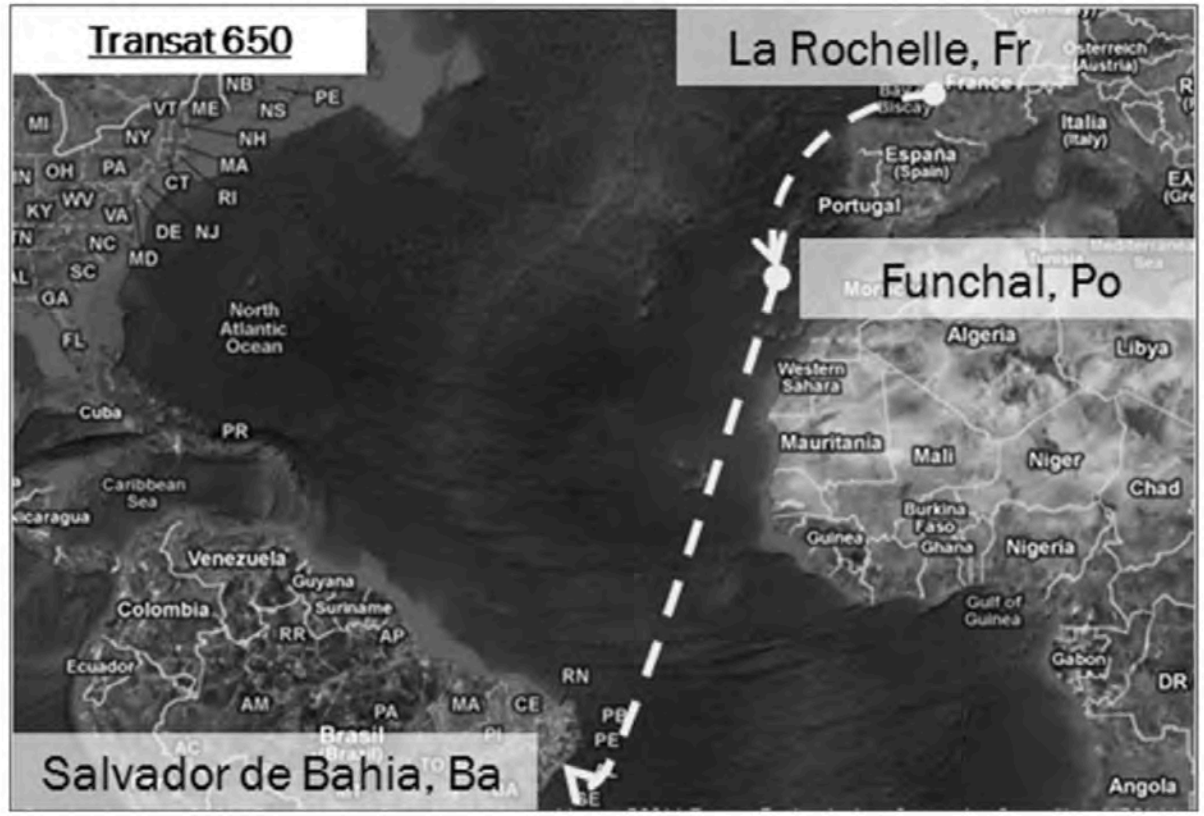
Sleep and Biological Rhythms 2012; **10**: 270–277 doi:10.1111/j.1479-8425.2012.00570.x

ORIGINAL ARTICLE

Field study of sleep and functional impairments in solo sailing races

Rémy HURDIEL,[1] Christelle MONACA,[2] Benoit MAUVIEUX,[3] Peter MCCAULEY,[4] Hans PA VAN DONGEN[4] and Denis THEUNYNCK[1]

[1]RELACS/ER3S Laboratory, University of the Littoral Opal Coast, Dunkirk, [2]Department of Clinical Neurophysiology, Salengro Hospital, Lille, and [3]INSERM Team ERI 27, Caen University, Caen, France, and [4]Sleep and Performance Research Center, Washington State University, Spokane, Washington, USA



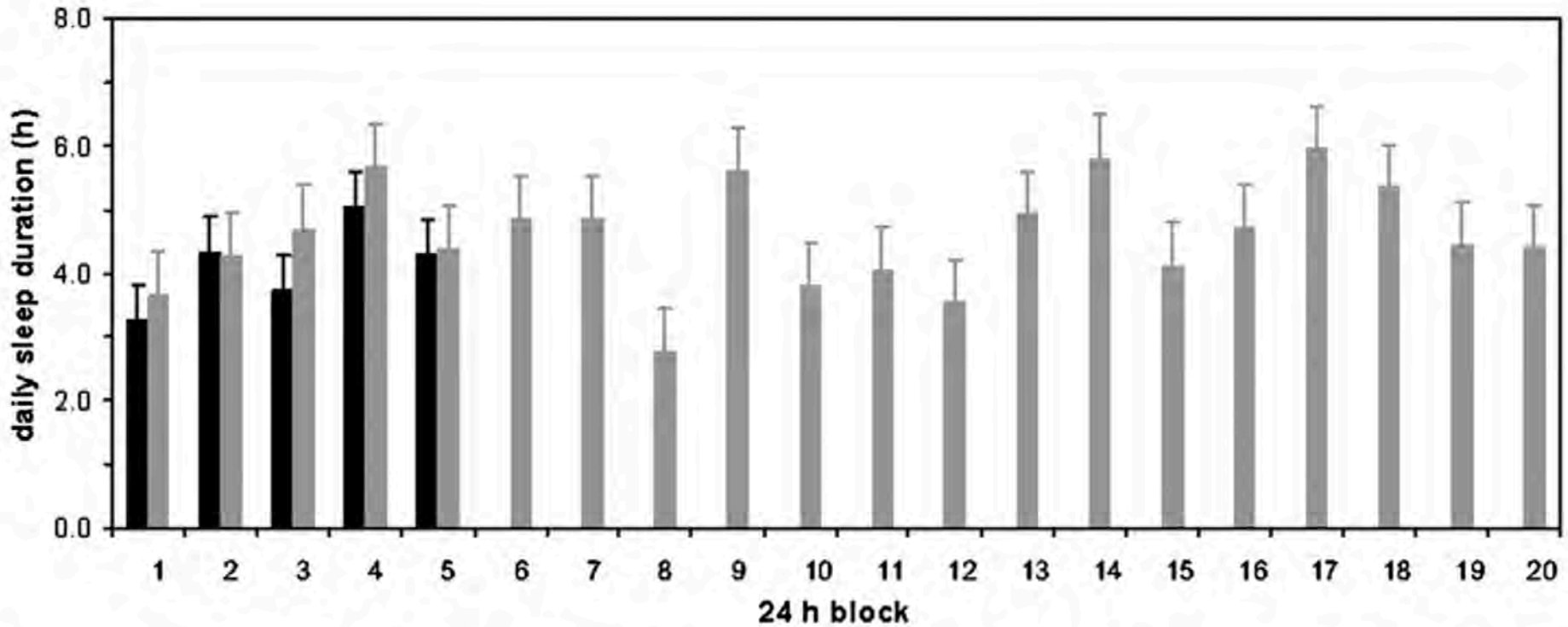


Figure 2 Sleep duration by day in race. Daily means (and standard errors) of sleep duration are shown as a function of days (24-h blocks from 08:00 until 08:00), for the first leg (black) and the second leg (gray).

Sleep Propensity

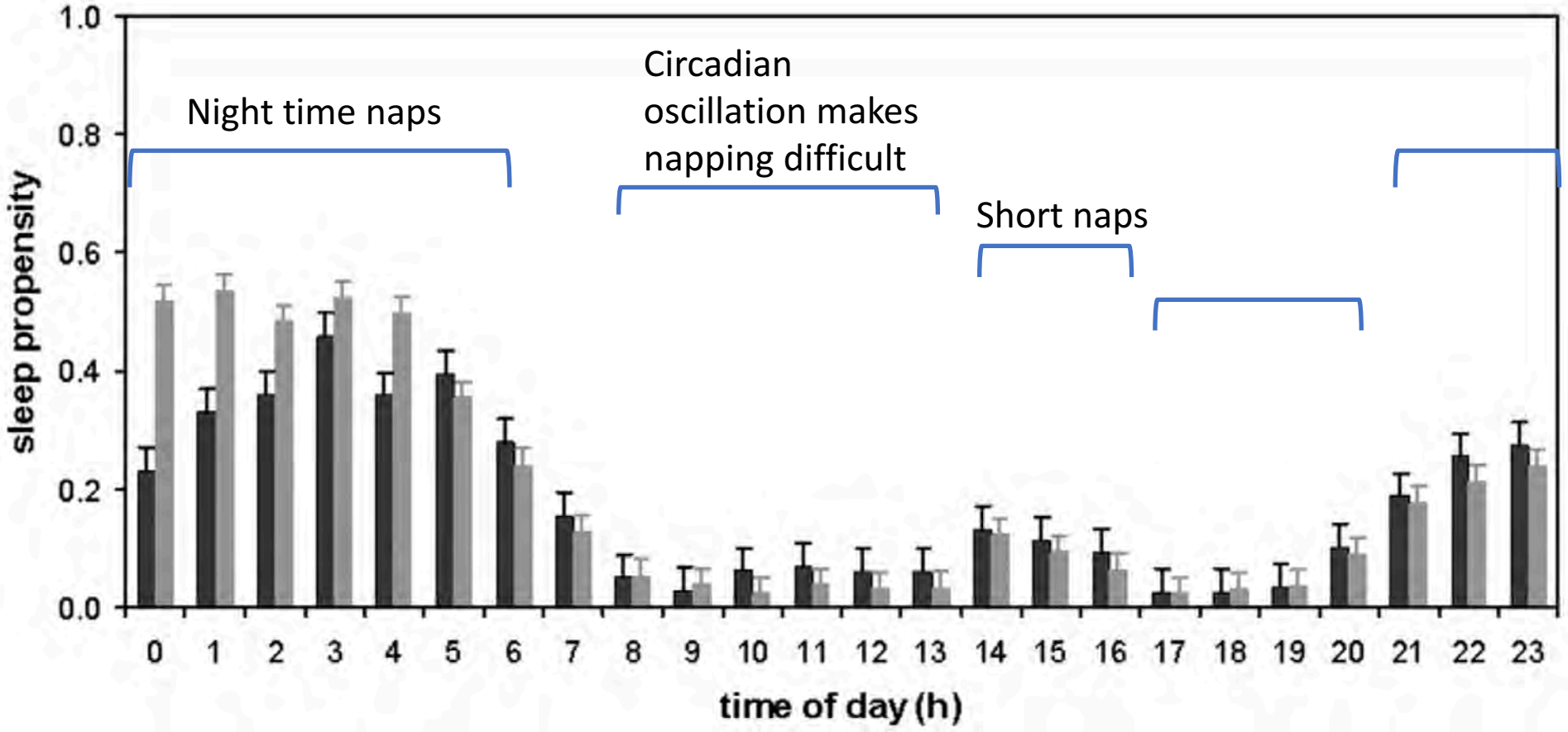


Figure 3 Sleep propensity by time of day. Means (and standard errors) for the fraction of sleep observed in each 1-h block are shown as a function of time of day, for the first leg (black) and the second leg (gray).

Table 1 Number and frequency of functional impairment reports in the two legs of the race

Descriptive events logged by sailors	Number in first leg	Average events / subject-day*	Number in second leg	Average events / subject-day*
Psychomotor impairments	15	0.25	12	0.08
Spinnaker rolled around forestay	5		2	
Broach (severe wipe-out with spinnaker)	3		3	
Equipment breakage (human error)	2		2	
Bad maneuver (jibe or tack)	2		1	
Torn sail	1		1	
Man overboard	1			
Equipment overboard	1		1	
Injury			1	
Onboard fuel spill			1	
Difficulties waking up	7	0.12	6	0.04
Did not hear alarm	4		3	
Reverie	2			
Sluggishness	1		3	
Hallucinations	5	0.08	0	0.0
Auditory	4			
Visual	1			
Mood disturbances	6	0.10	3	0.02
Sadness	5		3	
Low motivation	1			

*A total of 12 participants × 5 days = 60 subject-days were included for the first leg, and 8 participants × 20 days = 160 subject-days were included for the second leg.

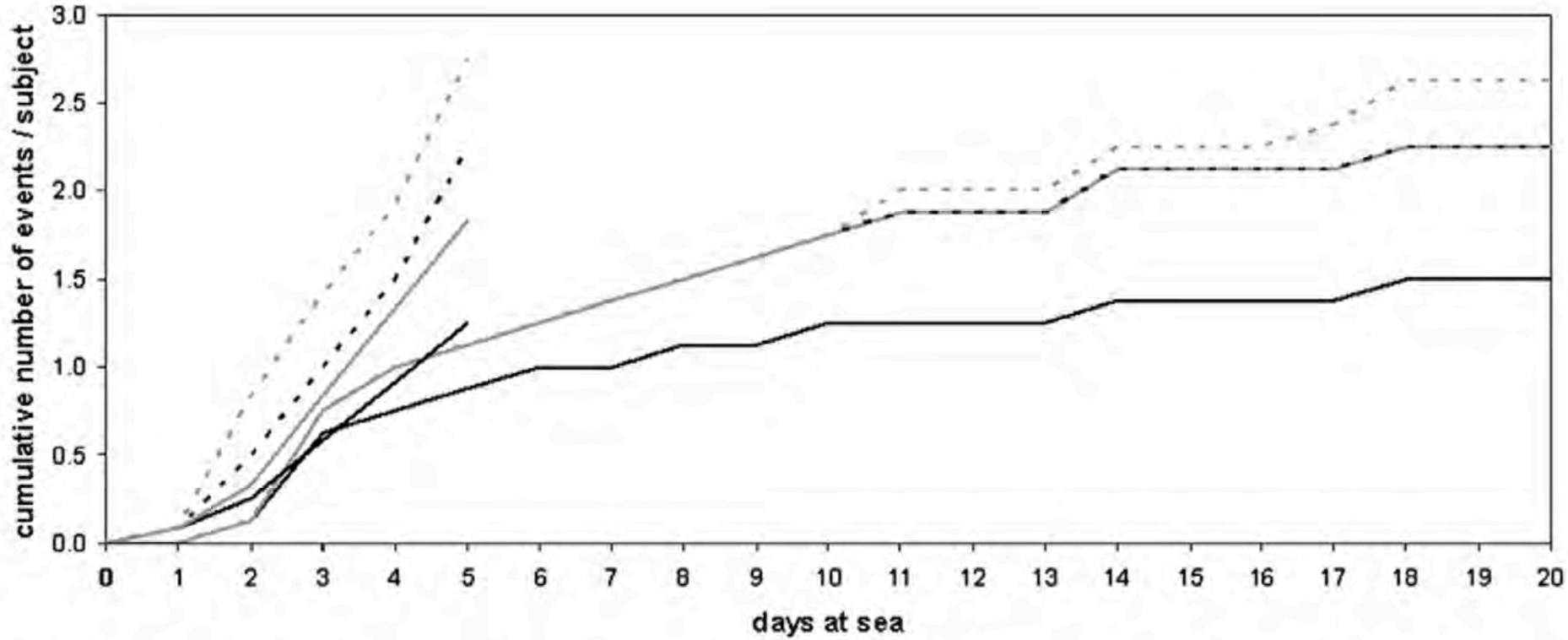


Figure 4 Cumulative number of functional impairments per subject by day in race. Short (5-day) curves are from the first leg (with 12 participants). Long (20-day) curves are from the second leg (with 8 participants). Impairment categories are stacked for each leg. Solid black = psychomotor impairments; solid gray = difficulties waking up; dashed black = hallucinatory experiences; dashed gray = mood disturbances.

Some rules of thumb

- The afternoon is a good time to nap
- Its easier to get short naps in the daytime
- Tailor naps to yourself, test before sailing
- Some people can exist on 20-30min naps only.
- I find 90min naps at night to be excellent in addition to daytime 20min naps. This also means that I am able to get REM sleep which helps prevent hallucinations.

Practice napping ashore and see what works for you

- My assistant knows not to book meetings between 14:00 and 14:30h
- I nap on my office couch
- I practice napping through the night at home
- Prior to a long race I practice in advance onshore
- On the first day of the B1-2 I will even take a nap before 6pm

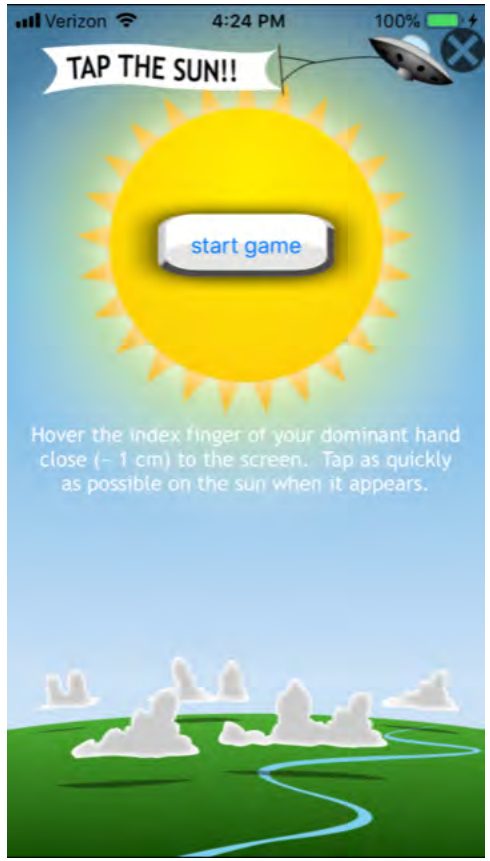
Caffeine? ½ life in plasma is 4-5h (make careful choices about when you drink tea or coffee)

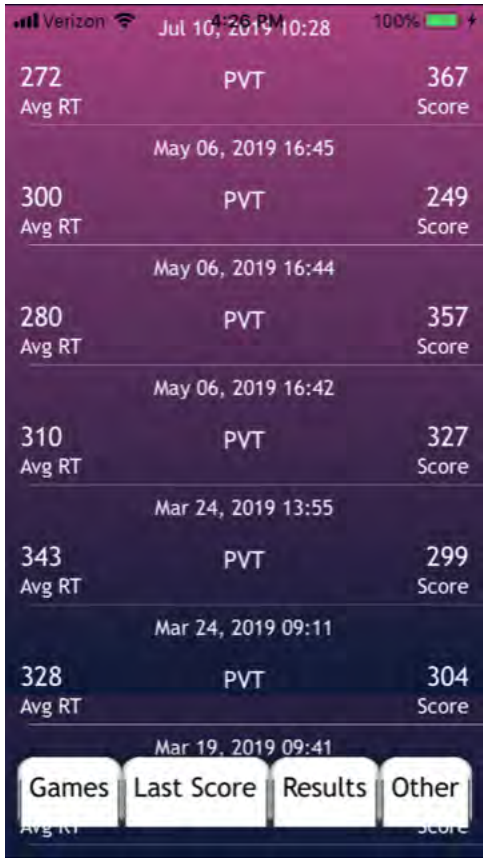
My rule of thumb

- 20 minute naps in the daytime
- 90-100 minute nap(s) at night when the conditions permit*
- Total of ~5h sleep per 24h day

- Stephen Lockley Ph.D. Brigham and Women's Hospital – consultant to NASA, helped me tailor my approach

Psychomotor vigilance





I do not advise sustained sleep deprivation

- Sustained sleep deprivation can lead to:
  - Cardiovascular defects
  - Impaired immunity
  - Synaptic engulfment
- Recent research shows that the “glymphatic pathway” of the brain, that is responsible for clearing toxins, is active during sleep

- *A sailor friend, John Manderson mentioned to me that I am the neurology equivalent of a cardiologist who smokes!*

Citations

Miles to Go Before I Sleep. Tim Zimmermann

https://www.outsideonline.com/1823431/miles-go-i-sleep

http://news.bbc.co.uk/sport2/hi/other_sports/3972965.stm

https://www.sailmagazine.com/cruising/sleep-and-seamanship?fbclid=IwAR0AuIZiGFy5nenSYk7eFBtu2NtQAH7TRx-EFgNF0QmhuZ66aKMUJBsGOyo

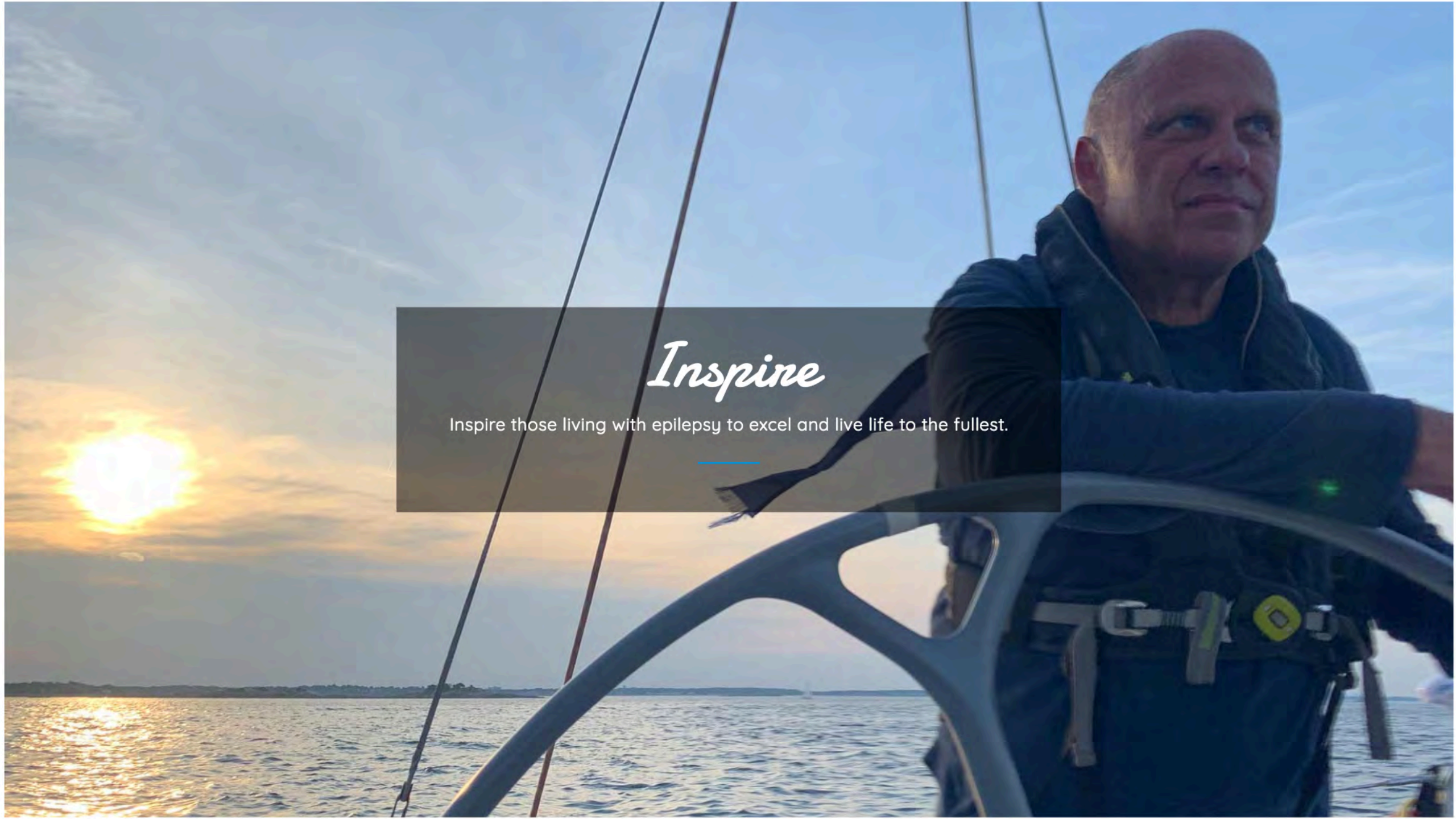
- https://www.youtube.com/watch?v=bL4kexuMLJQ

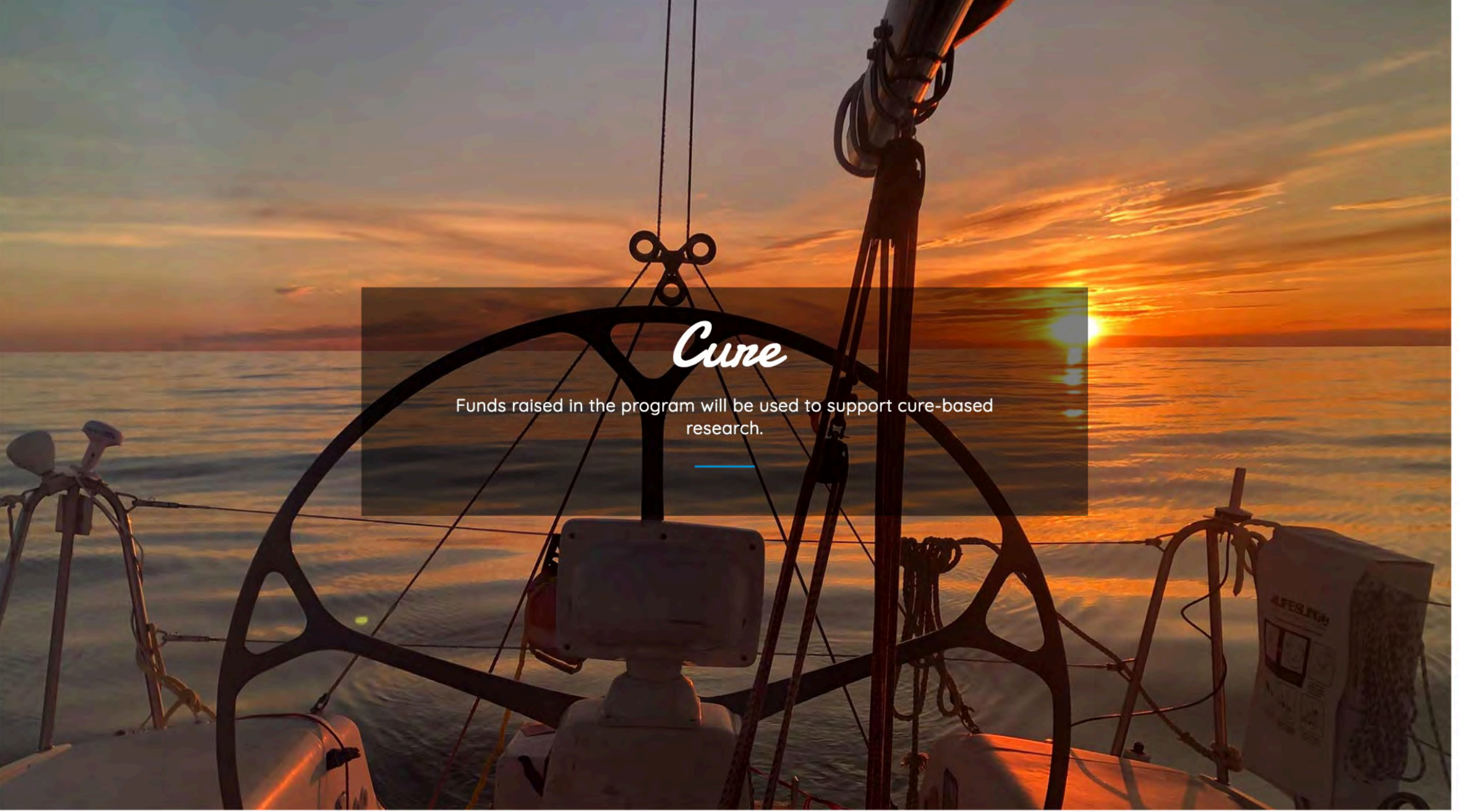
Sail 4 Epilepsy

Navigate. Inspire. Cure. Educate.

Navigate

Sailing the world to raise awareness for epilepsy.


Inspire
Inspire those living with epilepsy to excel and live life to the fullest.


Cure
Funds raised in the program will be used to support cure-based research.


Educate
Educate patients, families, caregivers & the public about epilepsy.

EPILEPSY FOUNDATION
New England

Partnership Announcement

NOVEMBER 1, 2019

Today, Sail4Epilepsy announced that Epilepsy Foundation New England will
University School of Medicine. Haydon said, “When I first met Susan Linn, the

FORT ADAMS, NEWPORT, RI

Sailing Camp With Sail To Prevail

A therapeutic -day afternoon adaptive sailing day camp for all ages living with epilepsy! This invigorating day camp with Sail to Prevail...

Learn More

Sail 4 Epilepsy

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philip.haydon@sailforepilepsy.org

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