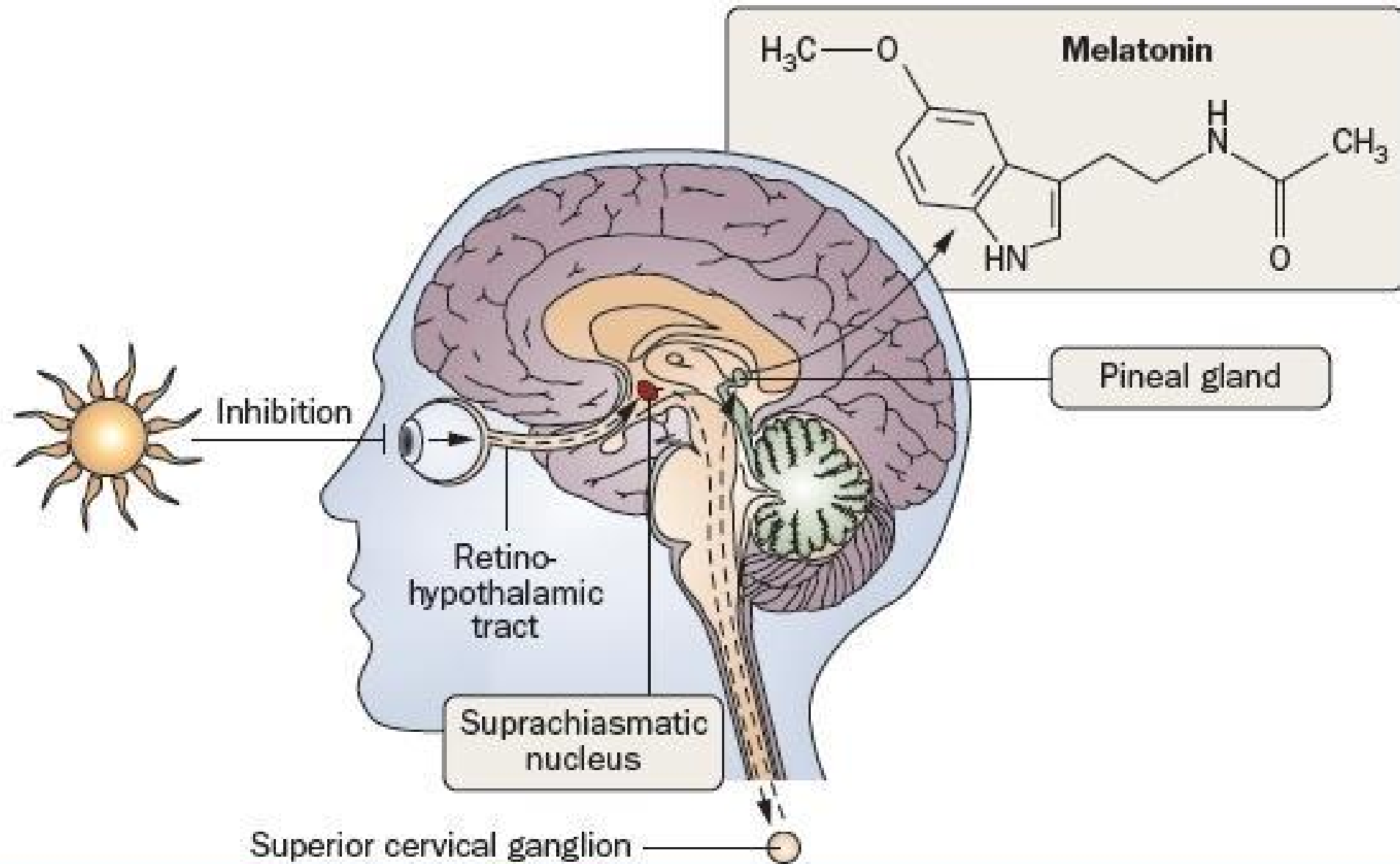
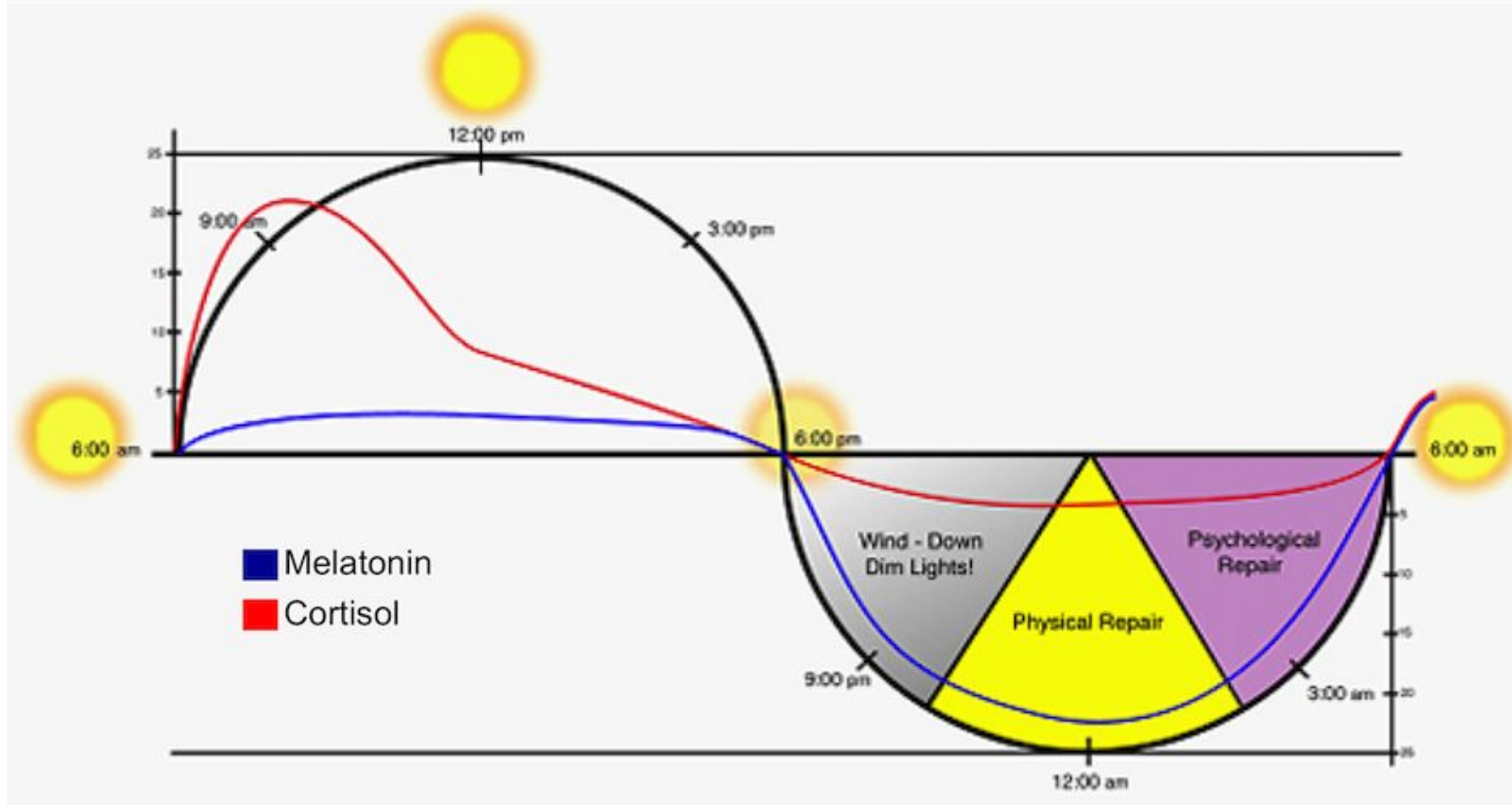


SLEEP & PAIN



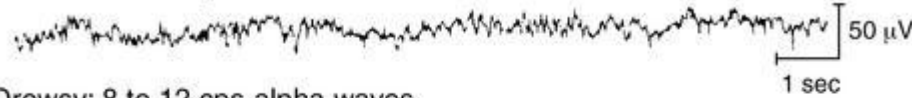
Circadian Rhythms



Architecture of Sleep

- Stage 1

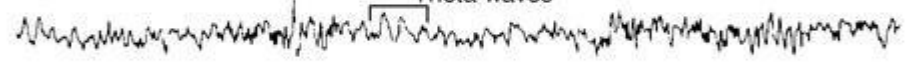
Awake: low voltage-random, fast



Drowsy: 8 to 12 cps-alpha waves



Stage 1: 3 to 7 cps-theta waves



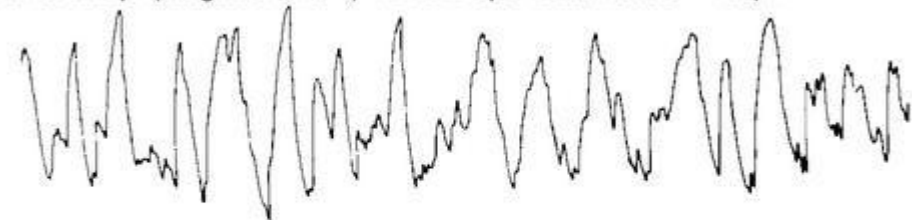
- Stage 2

Stage 2: 12 to 14 cps-sleep spindles and K complexes



- Stage 3 [?4]

Delta sleep: (stages 3 and 4) 1/2 to 2 cps-delta waves > 75 μV

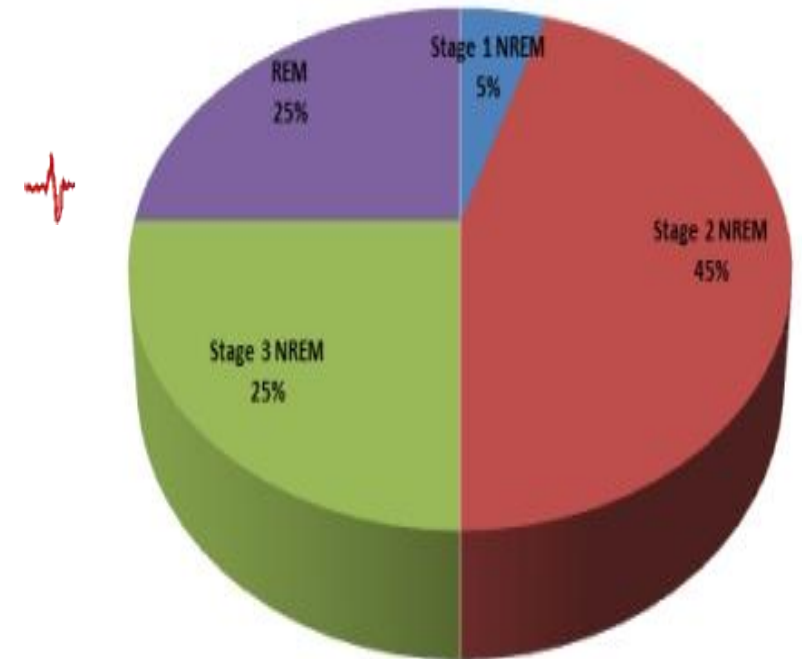


- REM sleep

REM sleep: low voltage-random, fast with sawtooth waves

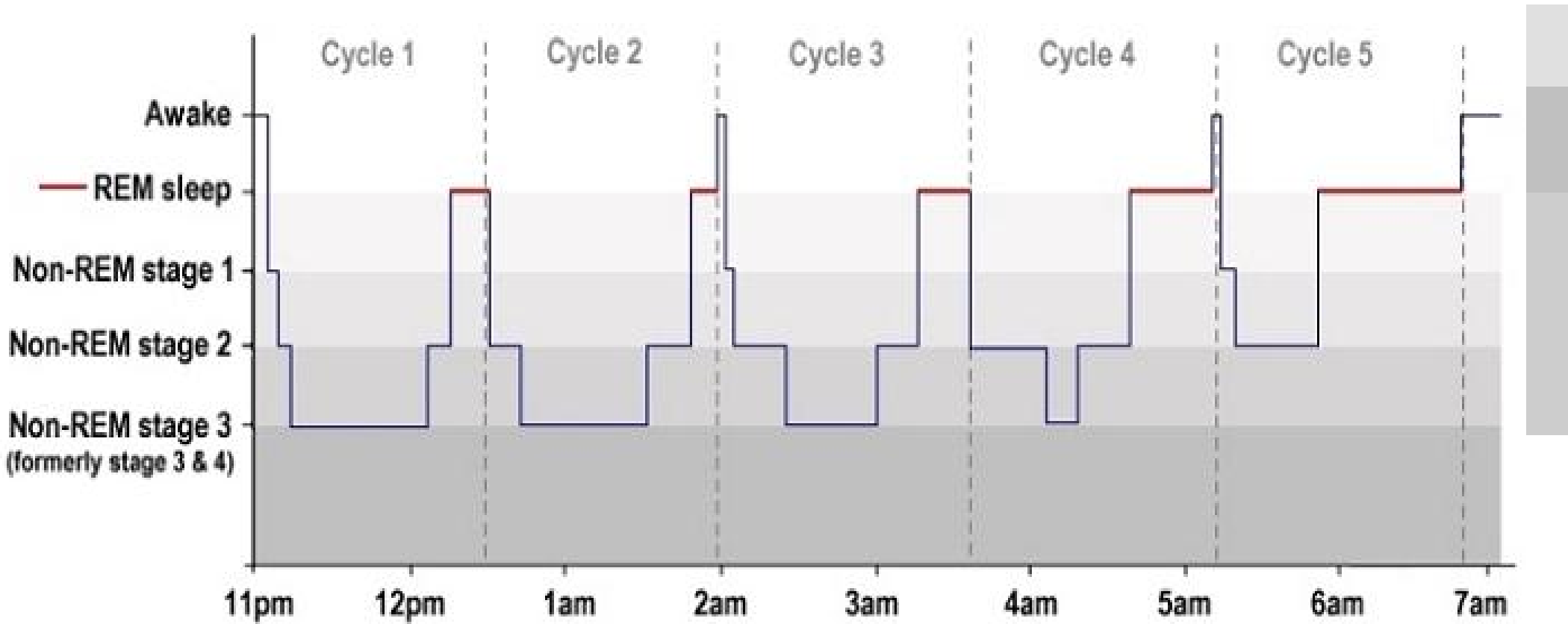


Duration of Sleep Stages



^aReprinted with permission from Hauri.²⁷

Sleep Cycles



Association between Sleep & Pain

- Sleep complaints present in 67-88% of pain disorders
- Are sleep & pain reciprocally or unidirectionally related?

The association of sleep and pain: An update and a path forward

[Patrick H. Finan](#), Ph.D.,^{1,*} [Burel R. Goodin](#), Ph.D.,² and [Michael T. Smith](#), Ph.D. [J Pain. 2013 Dec; 14\(12\): 1539–1552.](#)

Association between Sleep & Pain

- Insomnia increased risk chronic musculoskeletal pain [regional & widespread]

Nitter AK, Pripp AH, Forseth K. Are sleep problems and non-specific health complaints risk factors for chronic pain? A prospective population-based study with 17 year follow-up. *Scandinavian Journal of Pain*. 2012;3:210–7.

- Good sleep predicted resolution of pain @ 1 year follow up

The natural history of headache: predictors of onset and recovery. *Boardman HF, Thomas E, Millson DS, Croft PR Cephalalgia*. 2006 Sep; 26(9):1080-8.

MAKE SLEEP A PRIORITY

Sleep Hygiene- Sleep is natural...in your DNA

- Set a time go to sleep & wake up- create habit
- Gentle afternoon exercise
- Eat smallish meal + no caffeine/V/tea + no alcohol – warm milk?
- Minimise drama – TV/computer /arguments
- Temperature – warm shower
- Light
- Journal
- Bed – comfortable only for sleep/sex
- 4/7/8

The role of sleep hygiene in promoting public health: A review of empirical evidence. [Irish LA](#)¹, [Kline CE](#)², [Gunn HE](#)², [Buysse DJ](#)², [Hall MH](#)². [Sleep Med Rev.](#) 2015 Aug;22:23-36.

MEDICATIONS

- ‘natural’ – herbs Valerian passiflora camomile etc
- Melatonin – helps sleep onset/overall incr 15 min
- Benzo’s - GABA/benzodiaz complex –decr REM & addictive
- Z drugs zopiclone, eszopiclo, zaleptin & zolpidem – don’t change architecture but addictive
- TCA [amitrip/nortrip] – change architecture but not addictive & reduce pain