

Zakaj spimo?

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nevrologinja in somnologinja



VZAJEMNA
zdravstvena zavarovalnica

FENS | Federation of
European
Neuroscience
Societies



TEDEN
MOŽGANOV



SiNAPSA
SLOVENSKO DRUŠTVO ZA NEUROLOGIJO
SLOVENIAN NEUROSCIENCE ASSOCIATION



za možgane

THE
DANA
FOUNDATION

Teden
možganov 2018

Na sanjah
svet stoji



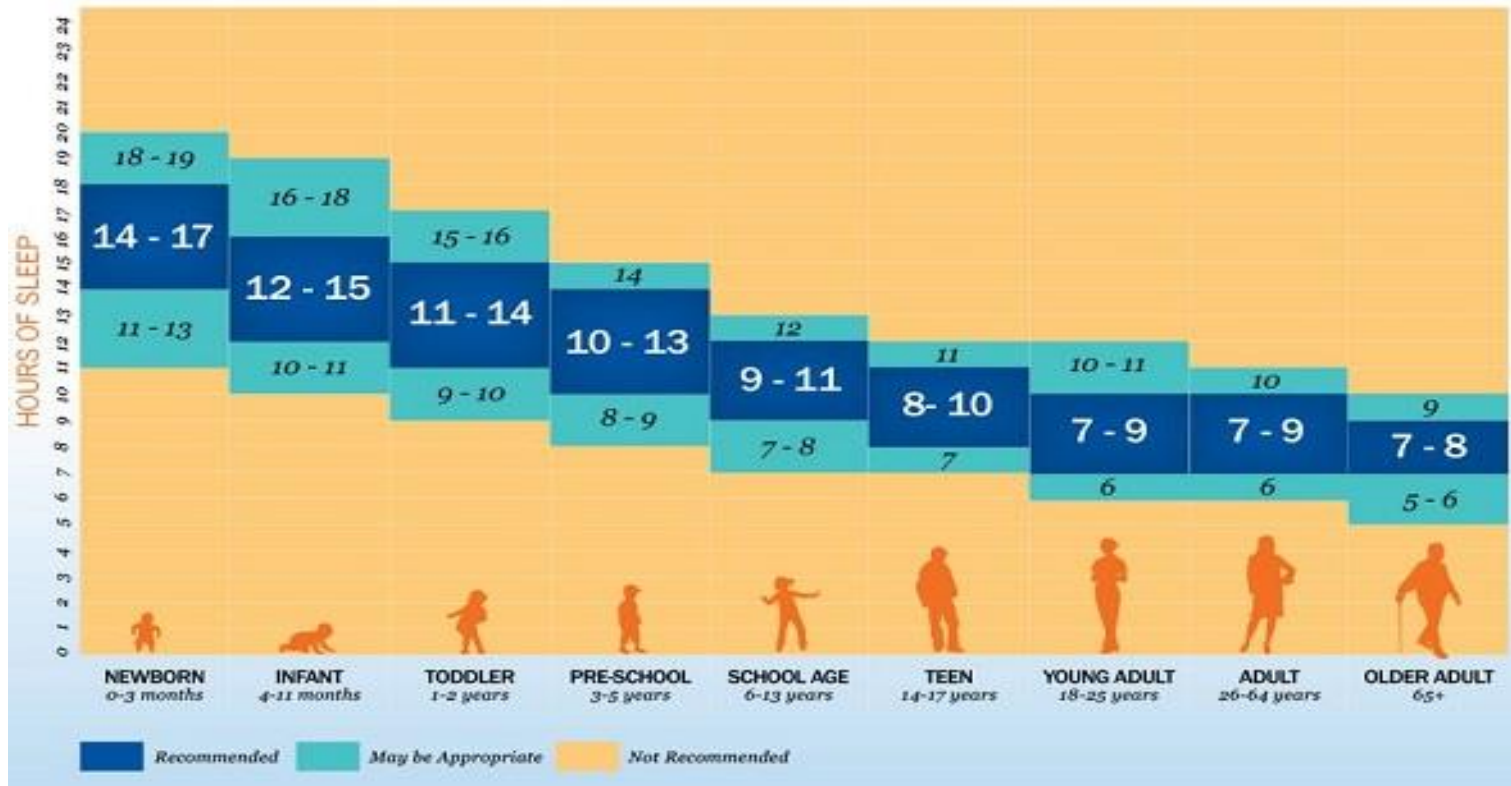
12.–18. marec

POTREBA PO SPANJU



 NATIONAL SLEEP FOUNDATION

SLEEP DURATION RECOMMENDATIONS



Lose Sleep, Lose Your Mind And Health

Early studies have linked lack of sleep to both colorectal and aggressive breast cancers.

Multiple studies have suggested a relationship between chronic sleep deprivation and increased obesity risk.

Research has linked short-term sleep deprivation with a propensity to load up on bigger portions, a preference for high-calorie, high-carb foods and a greater likelihood of choosing unhealthy foods while grocery shopping.



Obesity risk jumps

Stroke risk quadruples

Hungrier and apt to eat more

More likely to have an accident

Not looking your best – or your most approachable

More likely to catch a cold

Losing brain tissue

More likely to get emotional

Less focused and having memory problems

Risk of death goes up



A SLEEP study evaluating 1,741 men and women over the course of 10 to 14 years found that men who slept fewer than six hours had a significant increase in mortality risk, even after adjusting for diabetes, hypertension and other factors.

A small, recent study of 15 men, published in the journal SLEEP, found that just one night of sleep deprivation was linked with signs of brain tissue loss.

AFTER A WHILE YOUR...

AFTER ONE NIGHT YOU'RE...



KRATKOTRAJNE IN DOLGOTRAJNE POSLEDICE POMANJKANJA SPANJA

ŽIVALSKI MODEL POMANJKANJA SPANJA



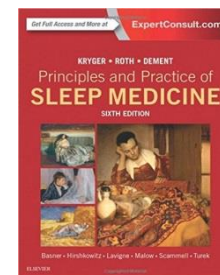
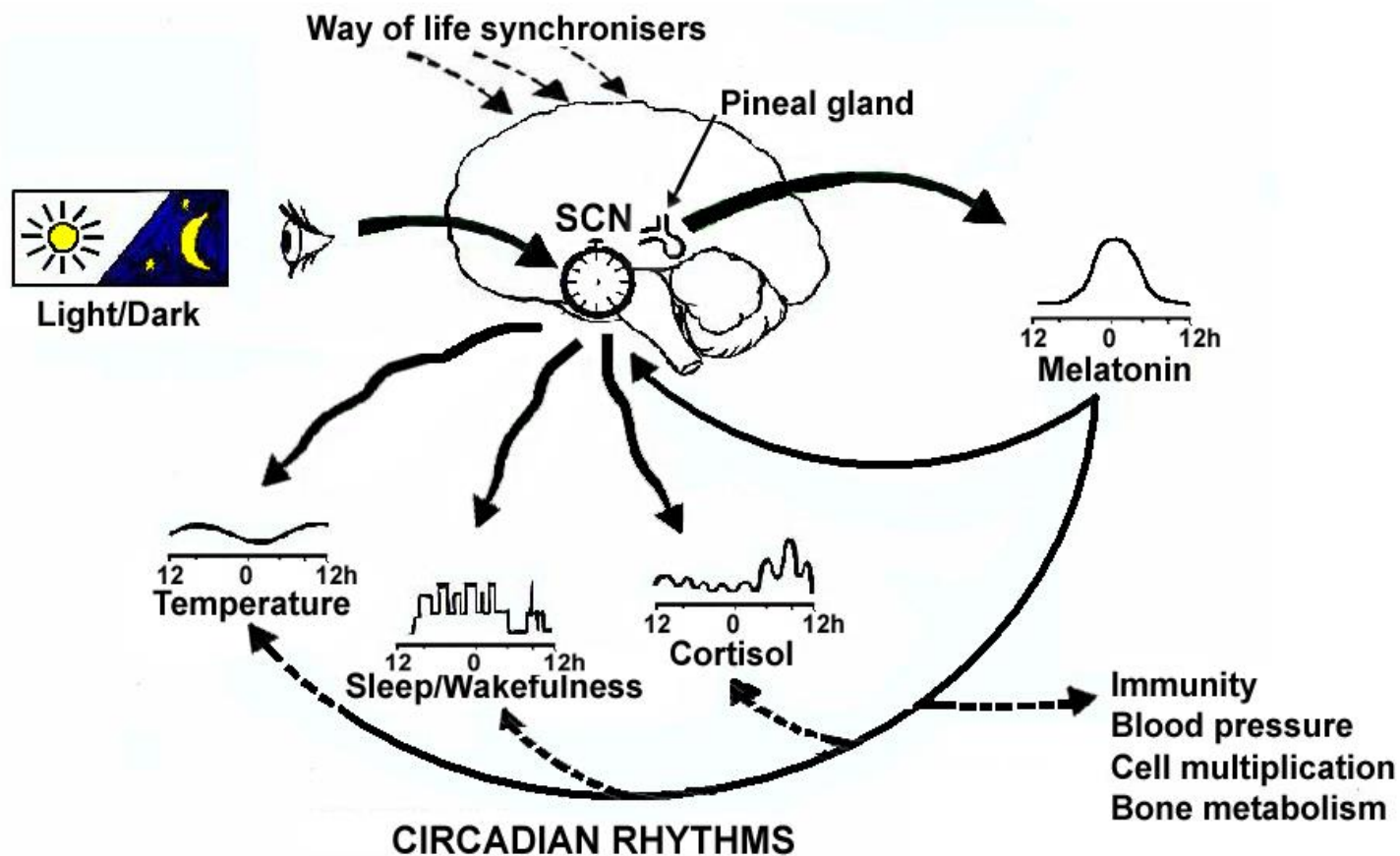
Pomanjkanje spanja pri podganah po 27 dneh vodi v smrt živali.

SVETOVNI REKORD DEPRIVACIJE SPANJA PRI ČLOVEKU

- Randy Gardner, leta 1964: 17-letni študent v San Diegu, Kaliforniji, je ostal buden **264 ur (11 dni)**.
- po deprivaciji spanja je imel hude težave z razpoloženjem, koncentracijo, kratkoročnim spominom, paranojo, halucinacijami,...

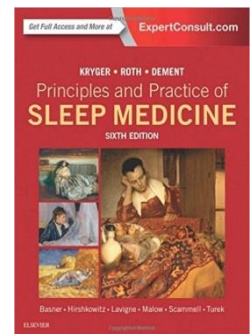


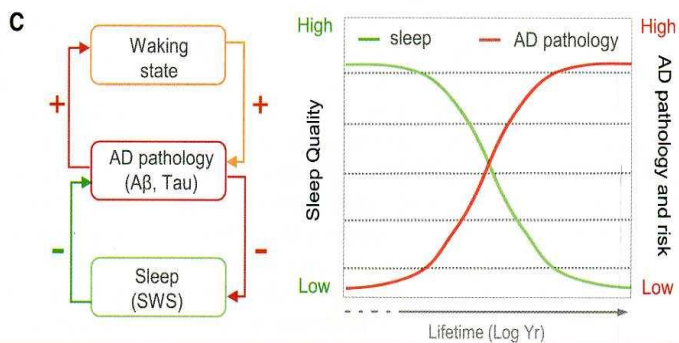
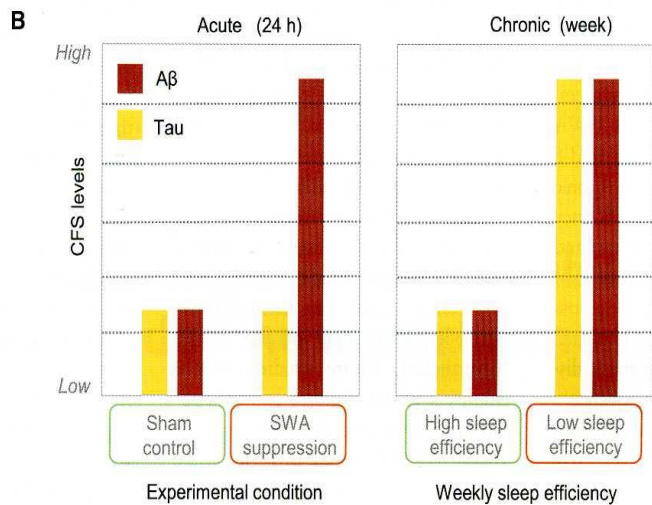
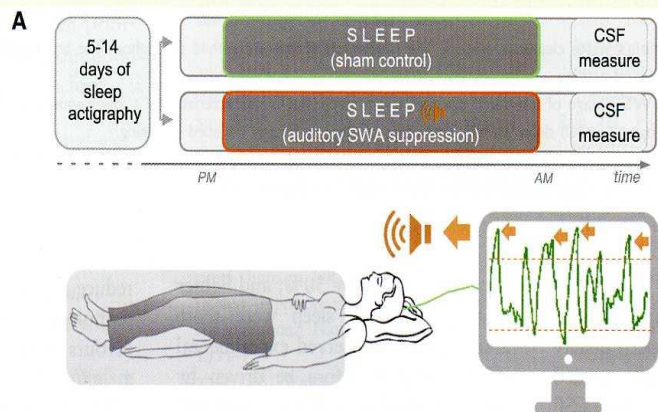
CIRKADIANI RITMI PRI ČLOVEKU



FUNKCIJE SPANJA

- obnovitev telesa, delitev celic
- sinteza prenašalcev v možganih
- imunski procesi
- termoregulacija
- izločanje hormonov
- spomin (kratkoročni-dolgoročni, brisanje nepotrebnih podatkov)
- odplavljanje degenerativnih snovi

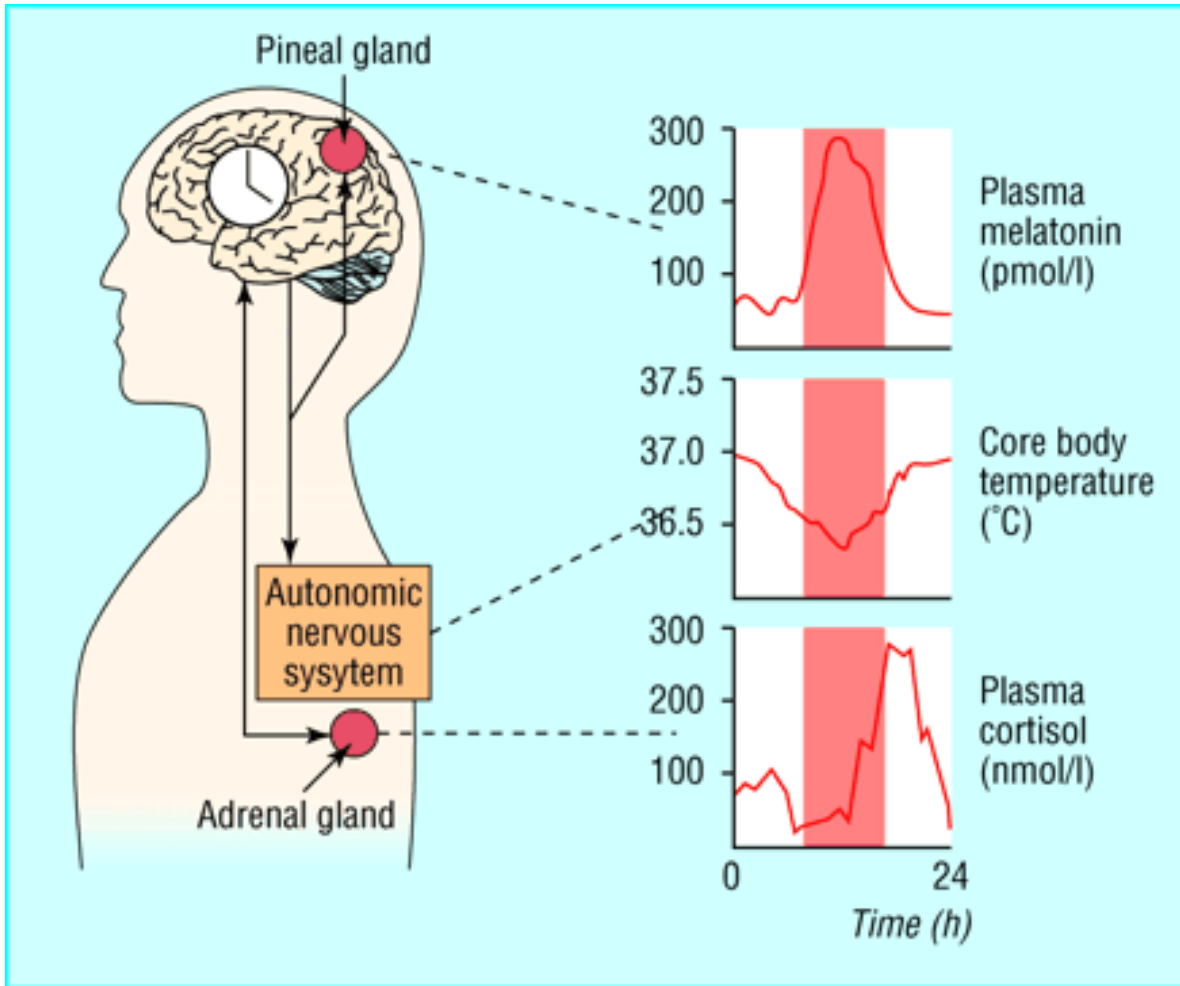




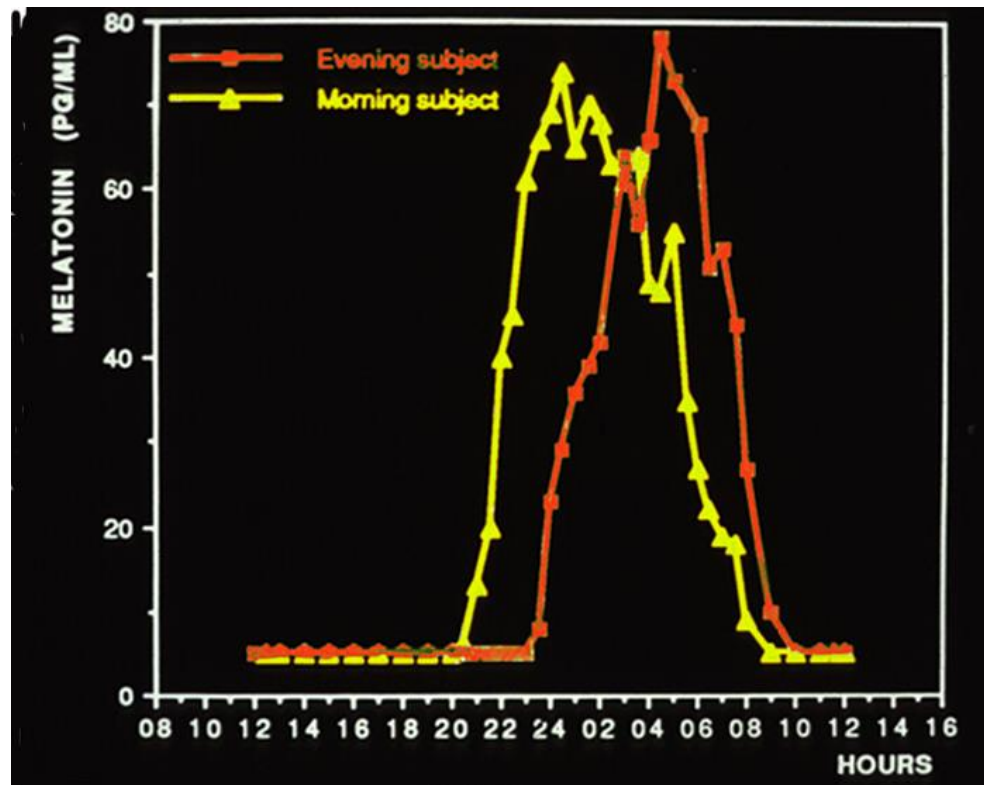
FUNKCIJA GLOBOKEGA SPANJA

Izplavljanje beta Amiloida in Tau

NOTRANJA URA V SCN SINHRONIZIRA OSTALA PERIFERNA JEDRA

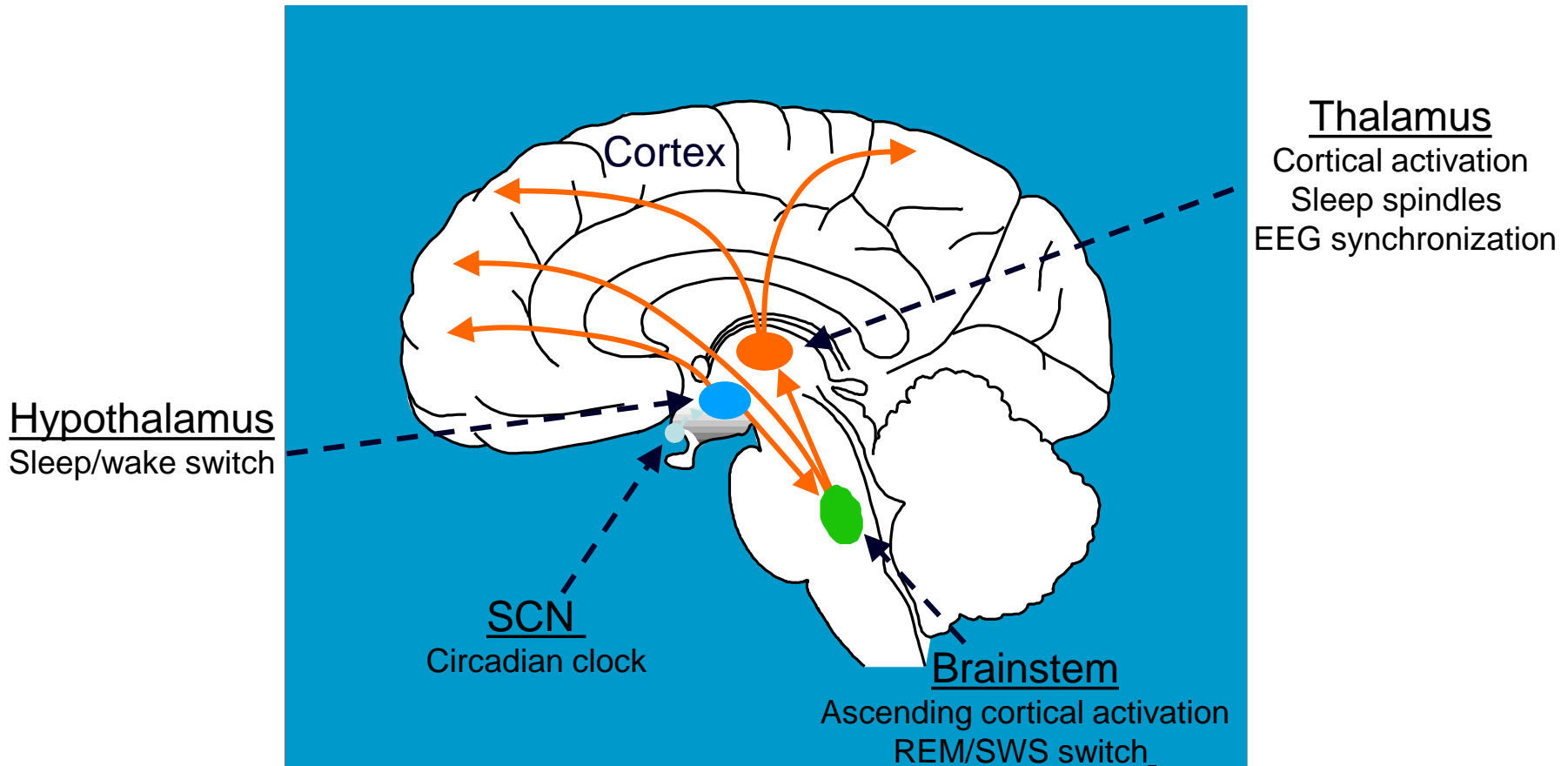


SPANJE - JUTRANJI, VEČERNI TIP



Hunter CM, Figueiro MG.
Measuring Light at Night and Melatonin Levels in Shift
Workers: A Review of the Literature.
Biol Res Nurs. 2017 Jul;19(4):365-374.

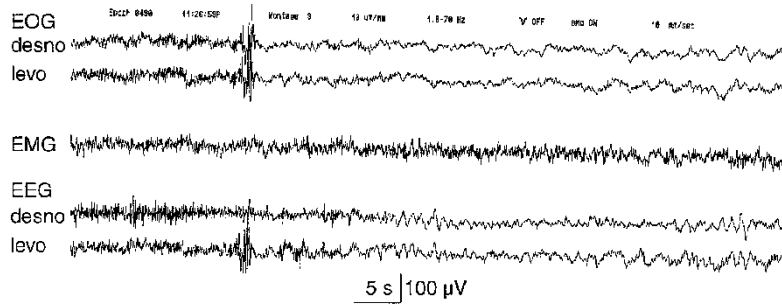
NEVROFIZIOLOGIJA BUDNOSTI IN SPANJA



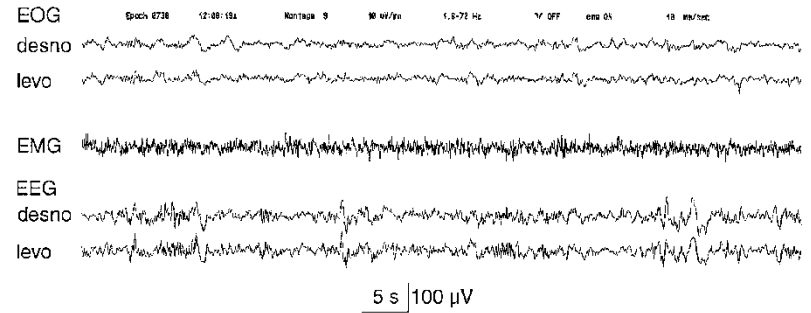
SCN = suprachiasmatic nucleus

FAZE SPANJA

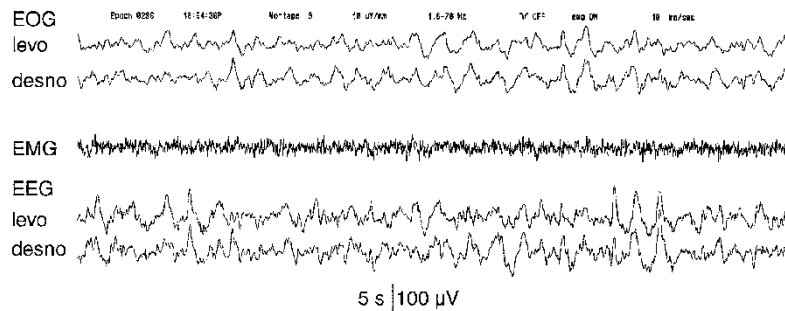
PRVA FAZA SPANJA



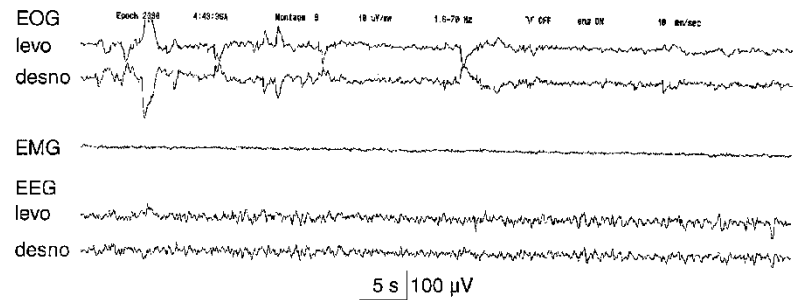
DRUGA FAZA SPANJA



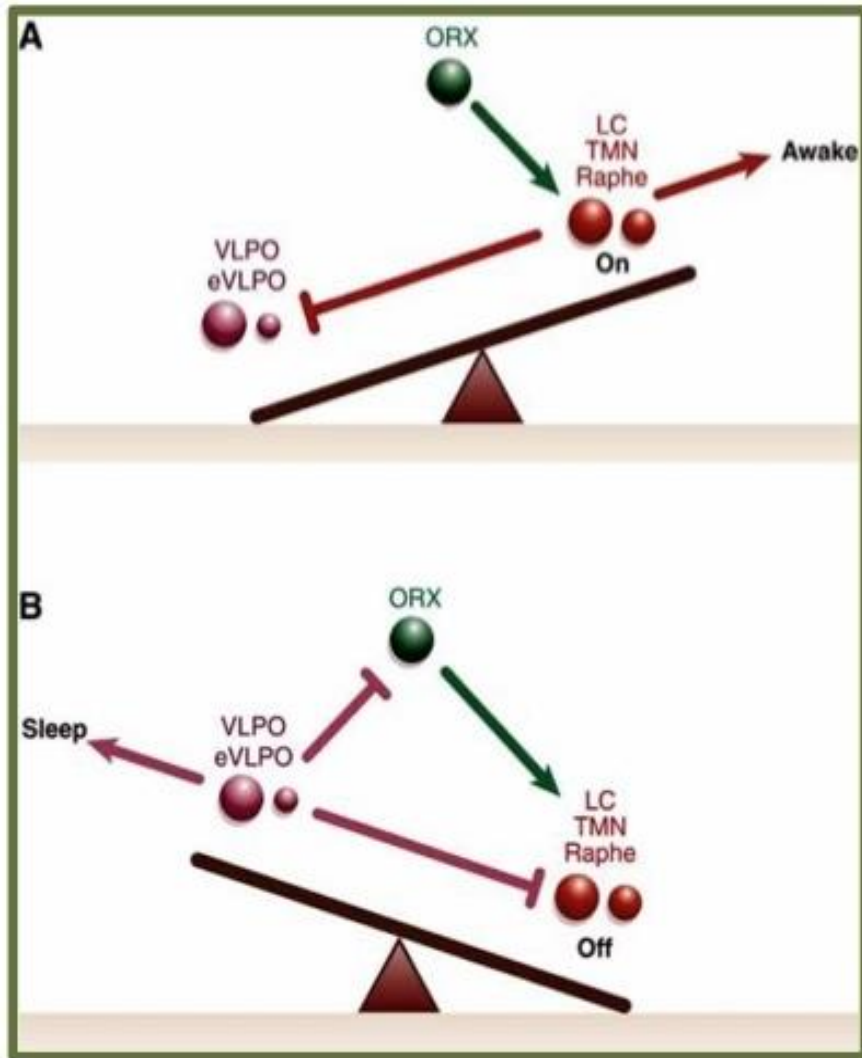
GLOBOKO SPANJE



PARADOKSNA FAZA SPANJA



MODEL PREKLOPA BUDNOSTI IN SPANJA



The 'flip-flop' switch model.

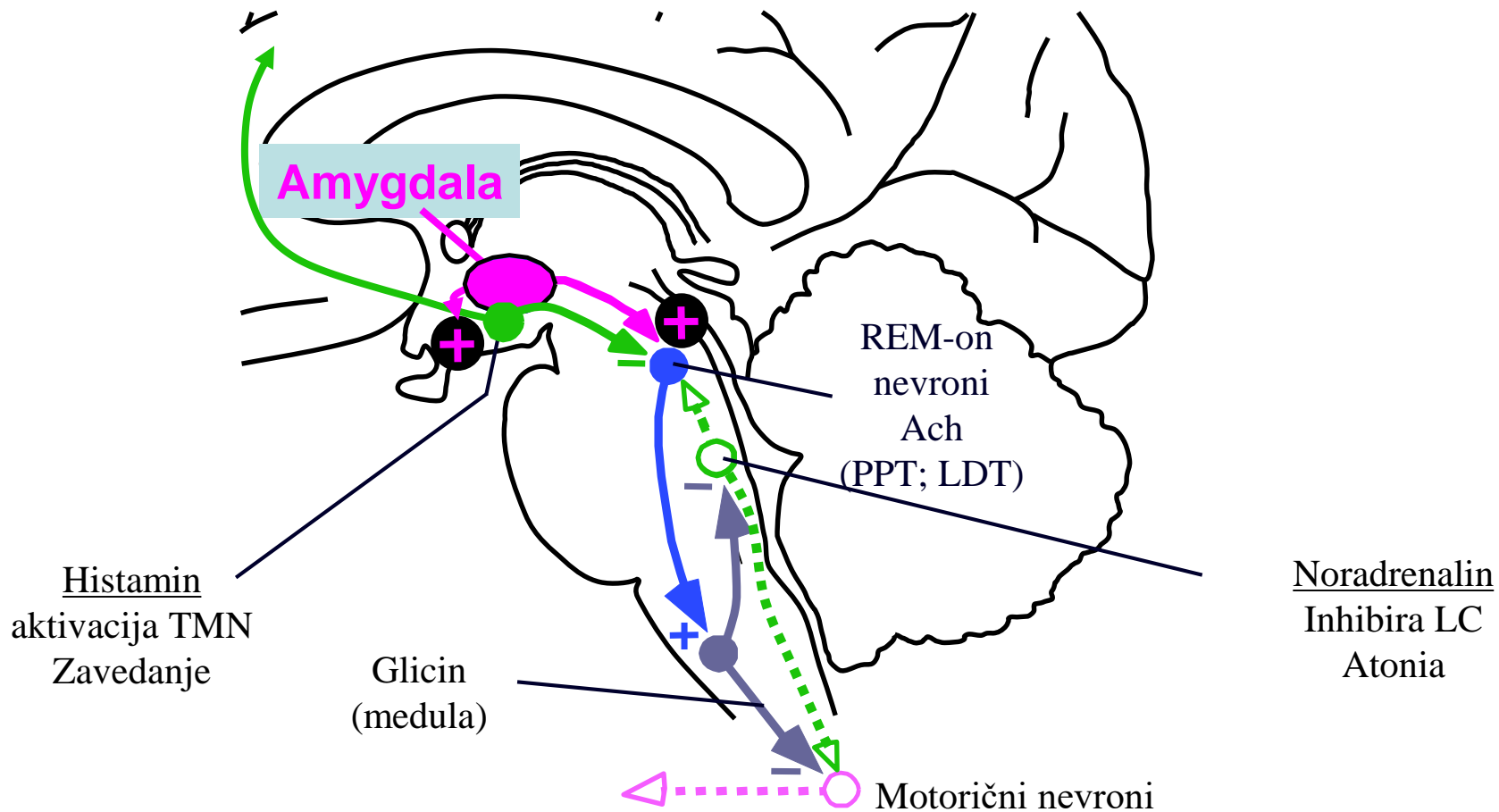
A) during wakefulness: ascending arousal system activated

B) during sleep: ascending arousal system inhibited. ORX: orexin neurons; LC: locus coeruleus; VLPO: ventrolateral preoptic nucleus; eVLPO: extended VLPO; TMN: tuberomammillary nucleus.

McCarley RW, Hobson JA (1975)
Neuronal excitability modulation over the sleep
cycle: a structural and mathematical model.

Science 189: 58–60

MIŠIČNA ATONIJA MED REM SPANJEM

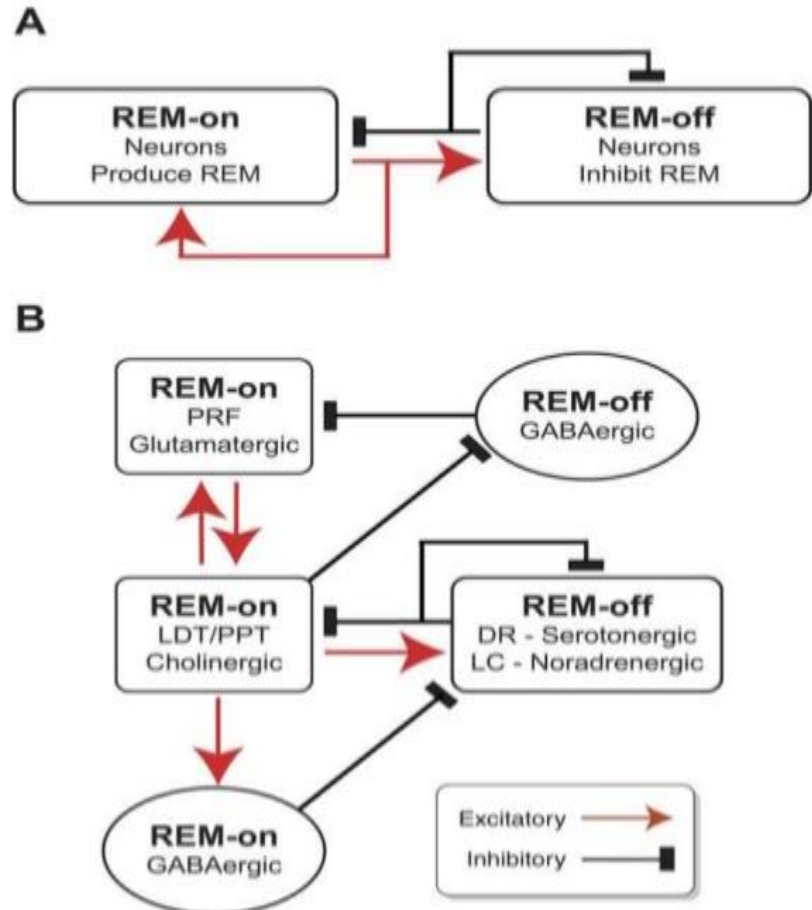
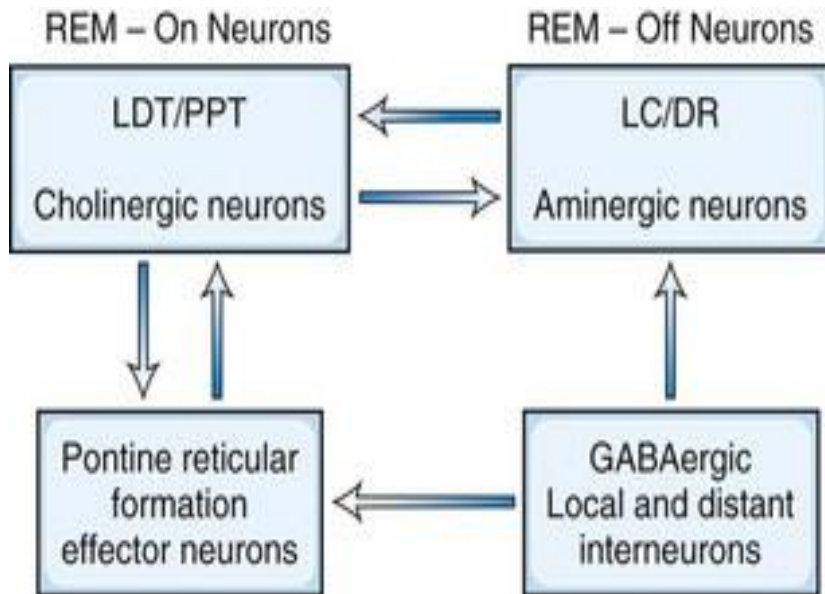


TMN = tuberomamilarno jedro; PPT = pedunkulopontino jedro; LDT = laterodorzalno tegmentno jedro; LC = lokus ceruleus

PSI Z NARKOLEPSIJO

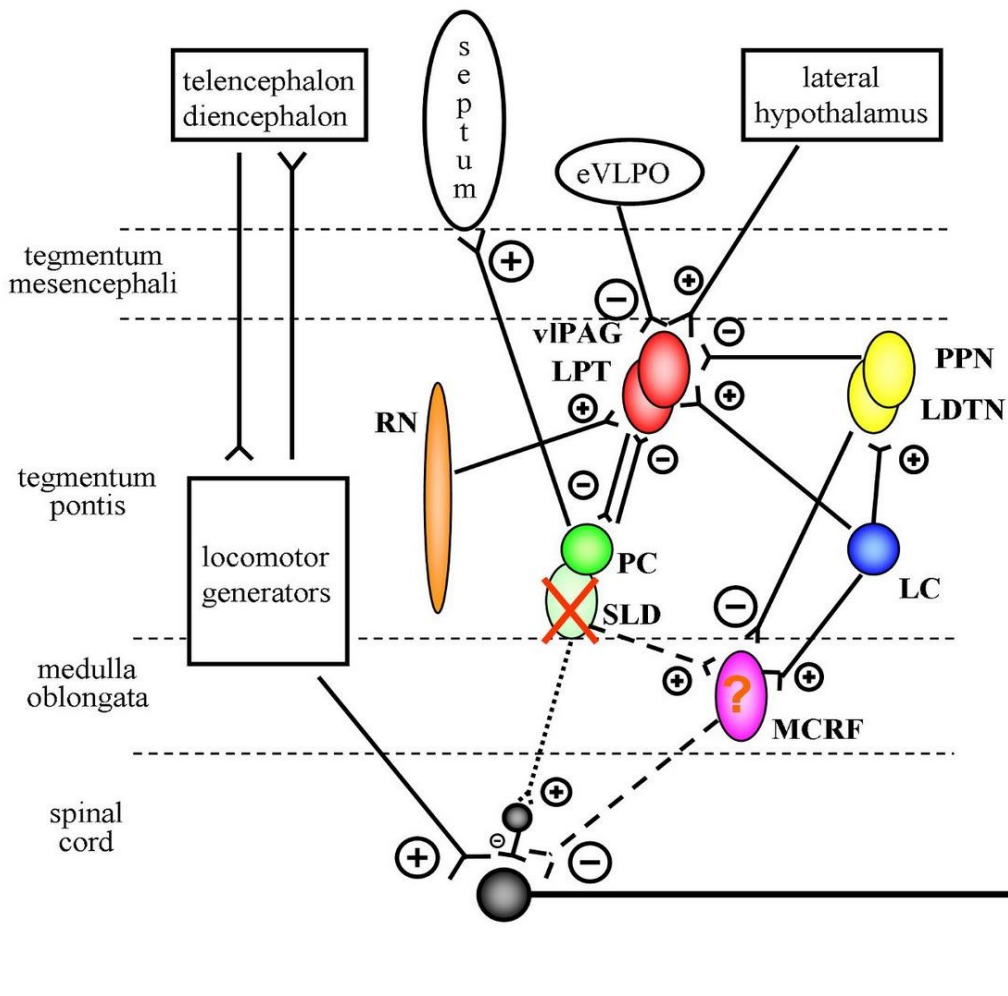


FIZIOLOGIJA REM SPANJA

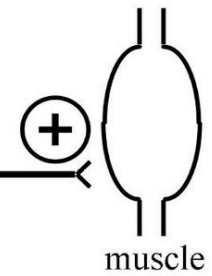
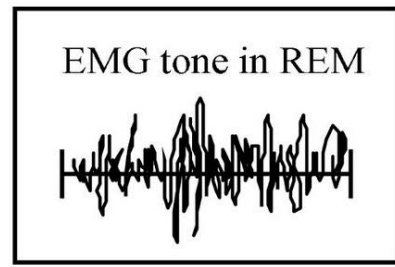


The original (A) and modified (B) reciprocal interaction models of REM sleep control, originally proposed by **McCarley and Hobson**

Proposed Pathophysiology of REM Sleep Behavior Disorder in Humans



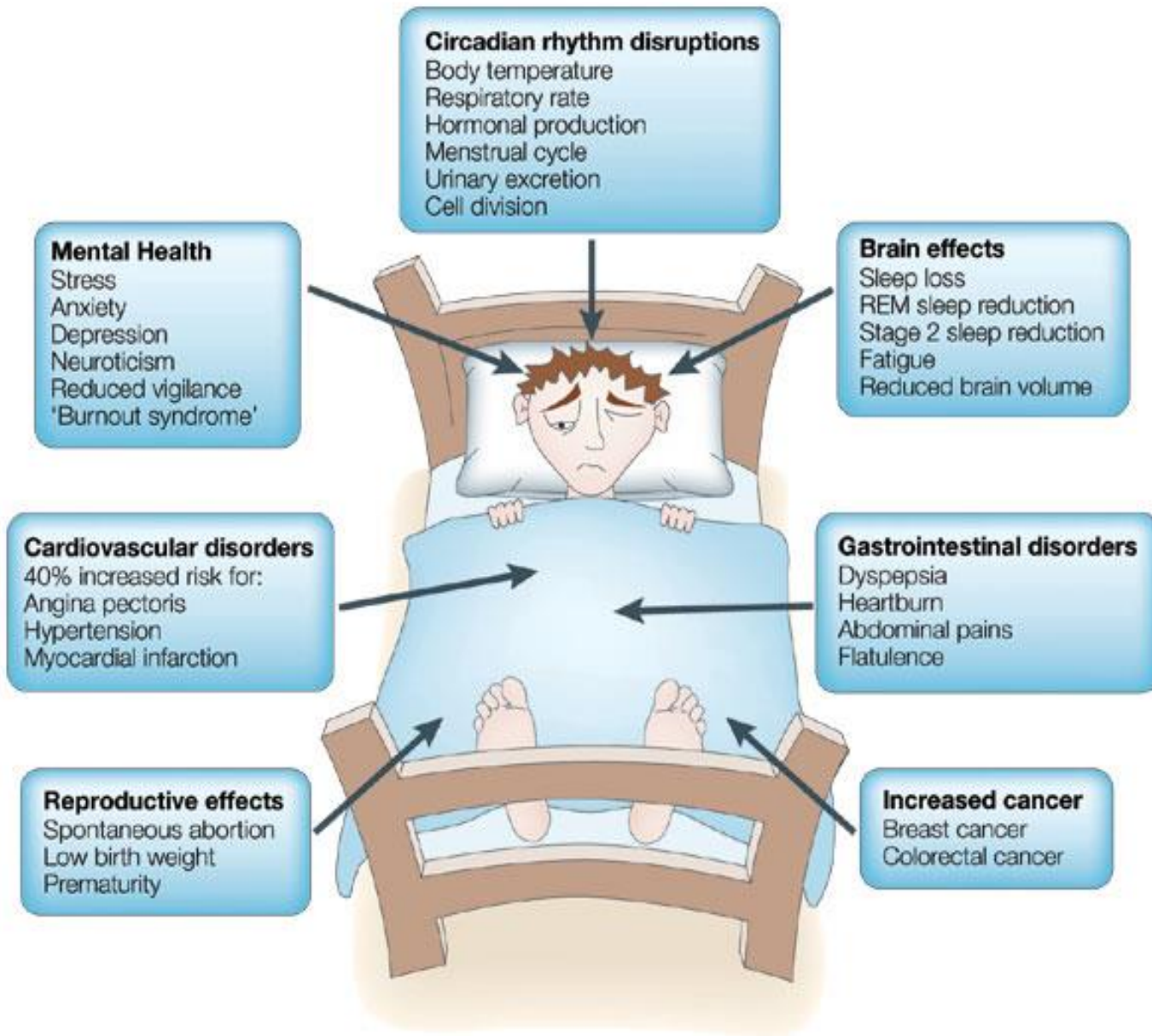
Lesions in sublaterodorsal nucleus
 +
 Sufficient locomotor drive
 =
 REM sleep behavior disorder



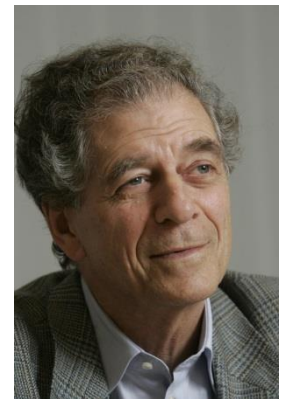
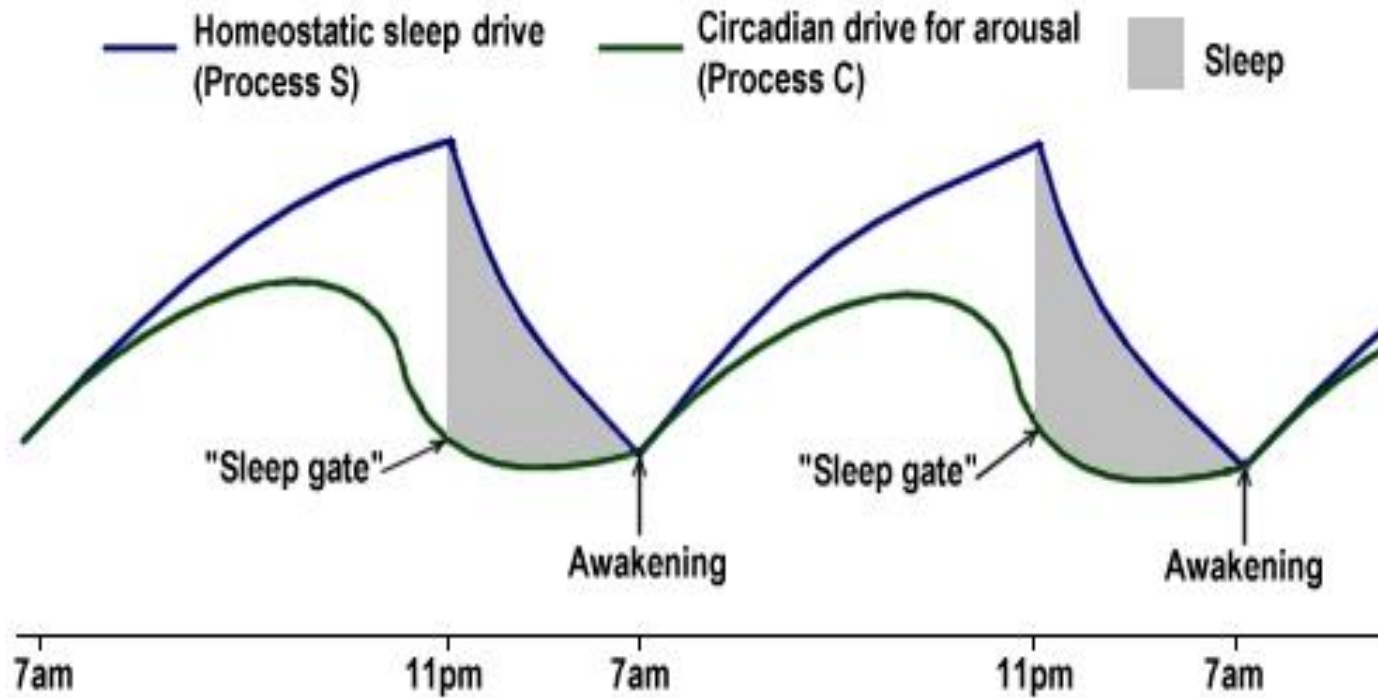
POSLEDICE NESPANJA

- če boste ostali neprekinjeno budni 17 do 18 ur, boste delali napake pri vožnji, ki so primerljive tistim, ko je stopnja alkohola v krvi 0,5 g/l
- če boste neprekinjeno budni 24 ur, boste delali napake pri vožnji, ki so primerljive tistim, ko je stopnja alkohola v krvi 1,00 g/l
- 20% vseh prometnih nezgod je posledica zaspanosti





HOMEOSTATSKI IN CIRKADIANI PROCES SPANJA



prof. A. Borbely

SPANJE V EKSTREMNIH POGOJIH



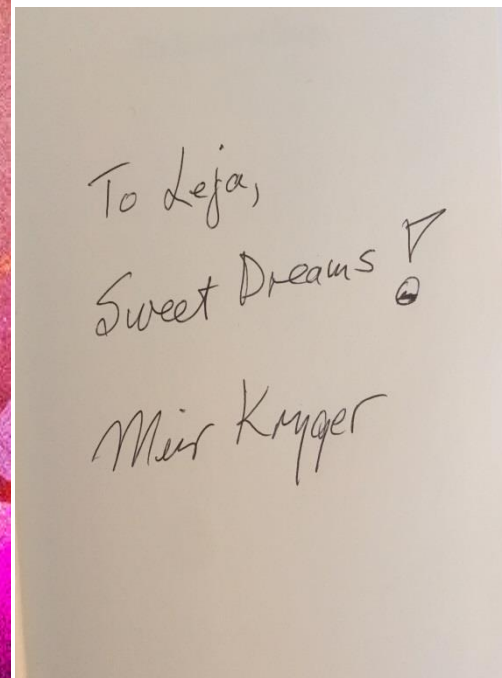
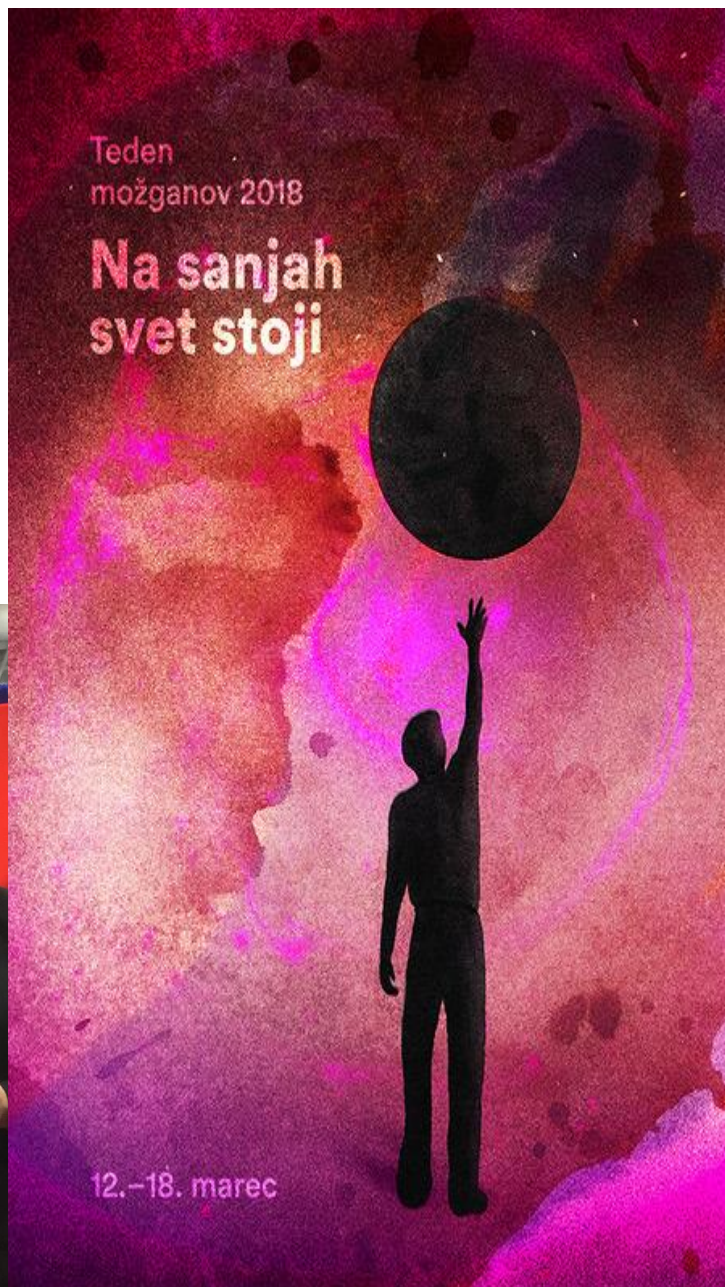
EPWORTHOVA LESTVICA ZASPANOSTI

SITUACIJA

Ocena: 0 - nikoli, 1- majhna verjetnost, 2 -
zmerna verjetnost, 3 - velika verjetnost

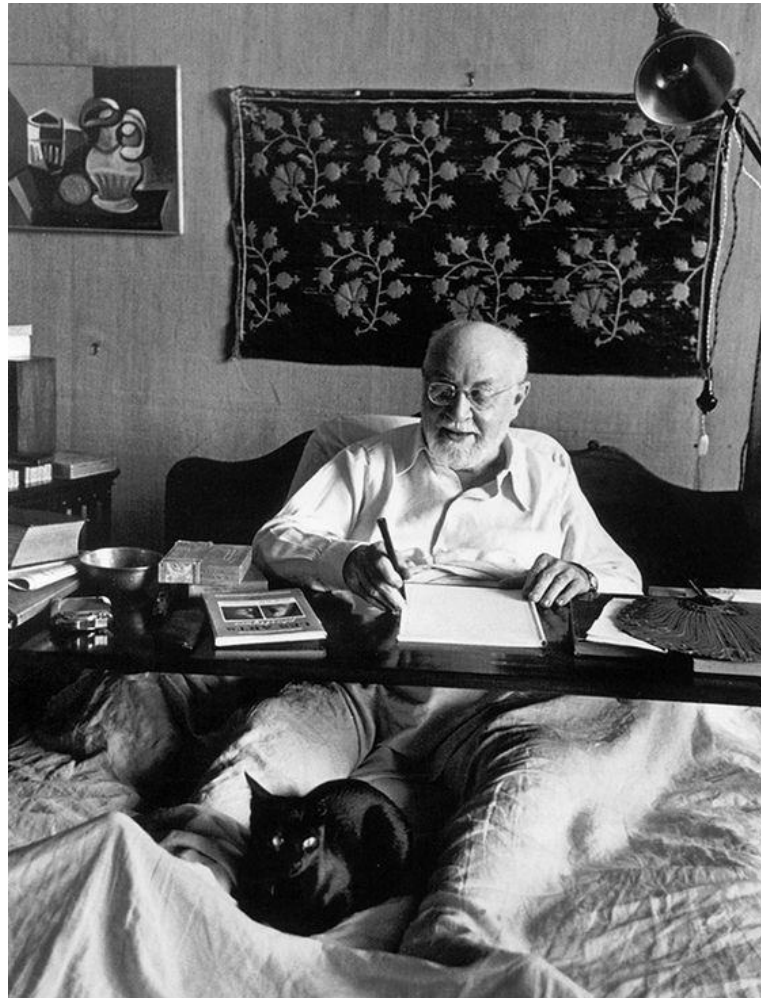
1. Med branjem sede	0	1	2	3
2. Med gledanjem televizije	0	1	2	3
3. Med sedenjem na javnem mestu (sestaneke, gledališče)	0	1	2	3
4. Kot sopotnik med enourno vožnjo brez postanka	0	1	2	3
5. Med popoldanskim počitkom leže	0	1	2	3
6. Sede med pogovorom s sogovornikom	0	1	2	3
7. Sede po obroku (kosilo), brez alkohola	0	1	2	3
8. Kot voznik v vozilu, ki se zaradi gneče za trenutek ustavi	0	1	2	3

Ocena zaspanosti po Epworthovi lestvici: > 10



**„Spanje ni mačji kašelj,
zanj je treba biti ves dan buden.“**

Nietzsche



*“Matisse and assistant”
Photo by Robert Capra*

HVALA!