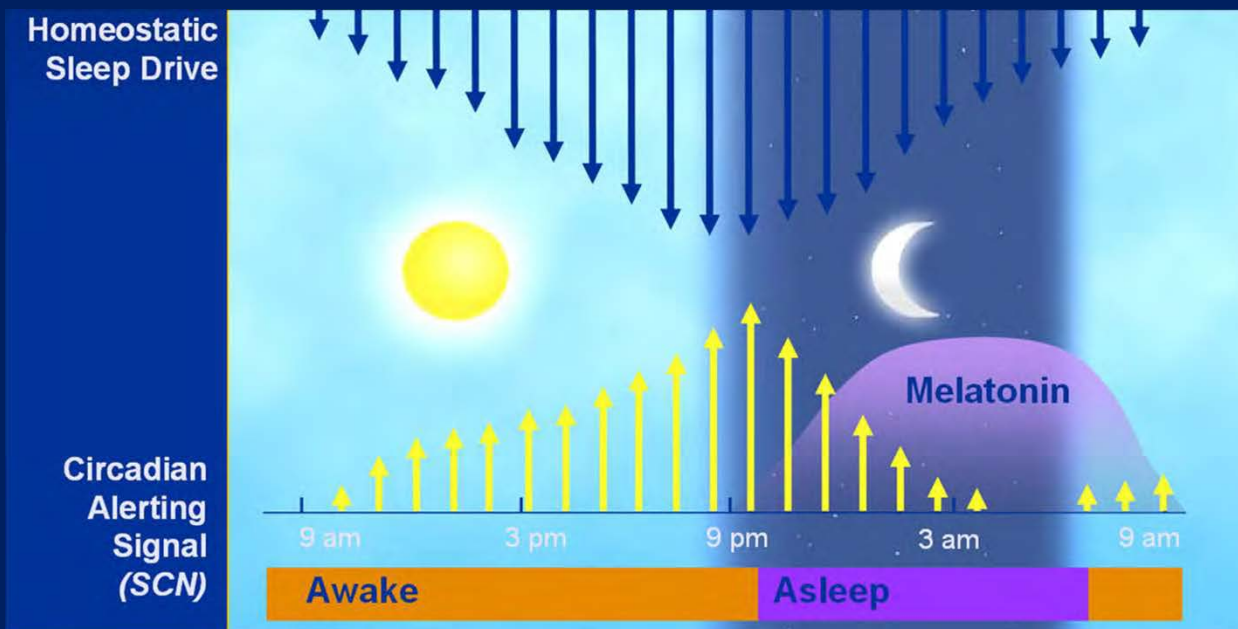




How to Sleep

Chris Aiken, MD
Director, Mood Treatment Center

Sleep: A 24-hour Cycle



Two forces drive sleep:

Sleep Drive:

Increases the longer you're awake.

Circadian Drive:

Cycles with sunlight and wake times.

Adenosine = Sleep Drive



- *Adenosine* rises the longer we stay awake and makes us sleep.
- *Caffeine* blocks adenosine.

Sleep Inertia

- Sound alarms wake us from deep sleep 90% of the time, causing *sleep inertia*.
- This groggy state lasts 15 minutes in most people, but up to 4 hours during depression.



Dawn Simulator

TURNS ON

Gradually over 30 minutes

IMPROVES

Alertness
Energy
Depression

EXAMPLES

Philips morning wake-up

LightenUp (best price)

Apps (*Rise & Shine*,
Lichtwecker)



Phillips HF3520/60 \$100

Dawn Simulation



\$20 at windhovermfg.com

Seasonal Affective Disorder (SAD)

- Positive in 8/10 small controlled trials (total n=446)
- 7/10 of those are placebo-controlled

Other Conditions

- Sleep inertia
- SAD in recovered alcoholics
- Sleep quality in normal adults (cross-over study, n=100)
- Attention, alertness, and working memory in adolescents and sleep deprived adults (pb-control)

Products

www.moodtreatmentcenter.com/products



Brisk Awakening

- Wake up at the same time each morning (within 15 minutes).
- Get out of bed immediately upon waking.
- Make the bed so it's harder to get back in.
- Start the day with energizing activity.



Melodic Music Reduces Sleep Inertia



McFarlane SJ et al, PLOS One 2020

Energizing Activity

Do these upon awakening:

- Page turners: the more you do them, the more you want to do them
- Aromatherapy (citrus, mint, rosemary)
- Morning playlist (e.g. dance or exercise music)
- Step outside, move around
- Cold water



Brisk Walking

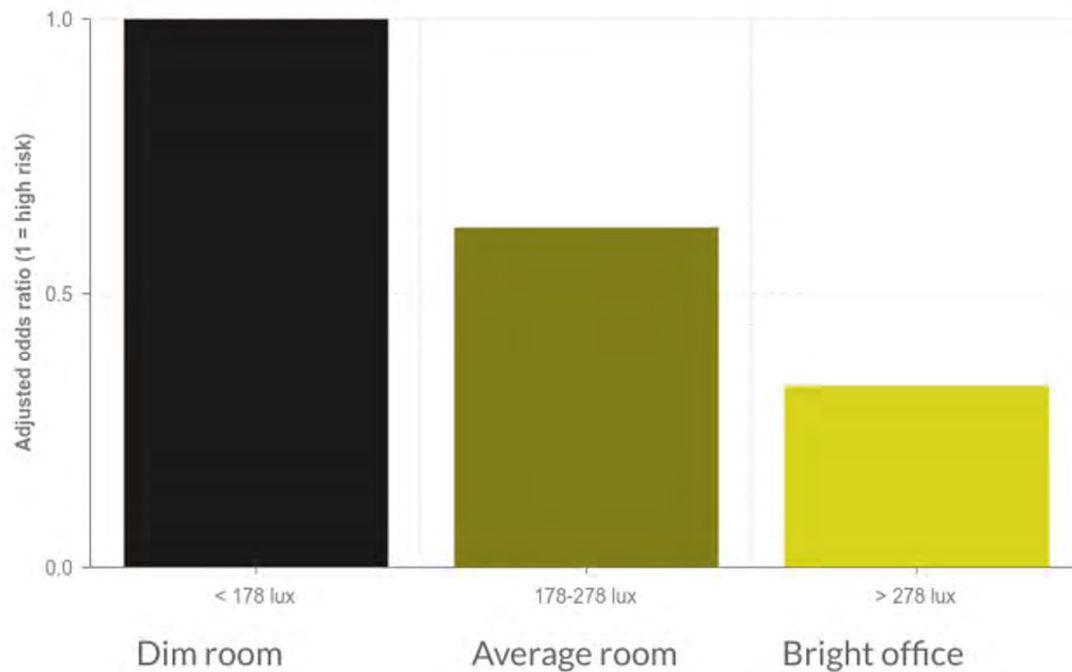
45 minutes every other day of
light aerobics

(raise heart rate by 10 bpm)



Daytime light and depression

Risk of Depression and Intensity of Daytime Light



Study type

- 1 181 patients with bipolar disorder followed over a week

Uncontrolled but adjusted for

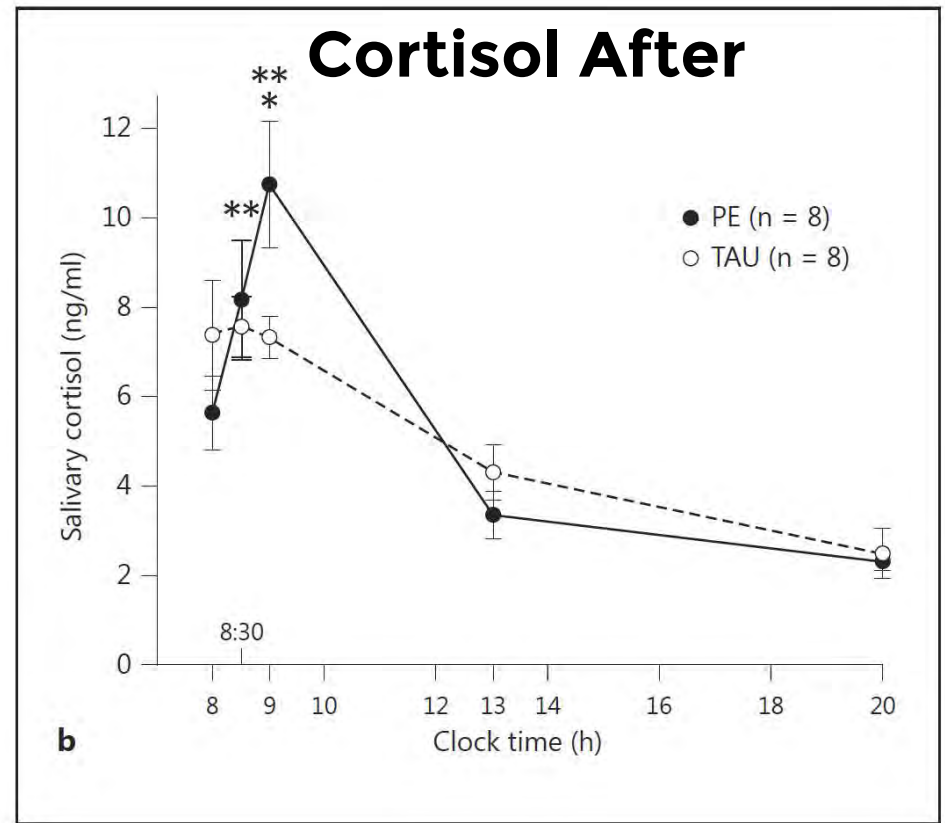
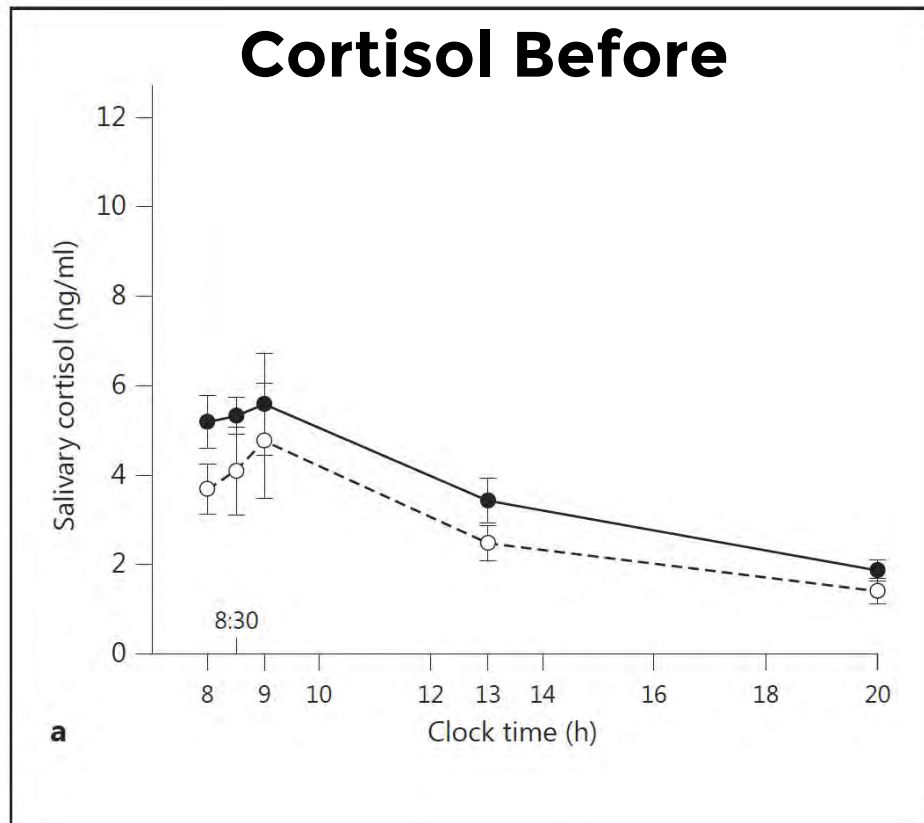
- 2 Physical activity, employment, bedtime, age, manic symptoms, and age, age at onset of bipolar

Replicated finding?

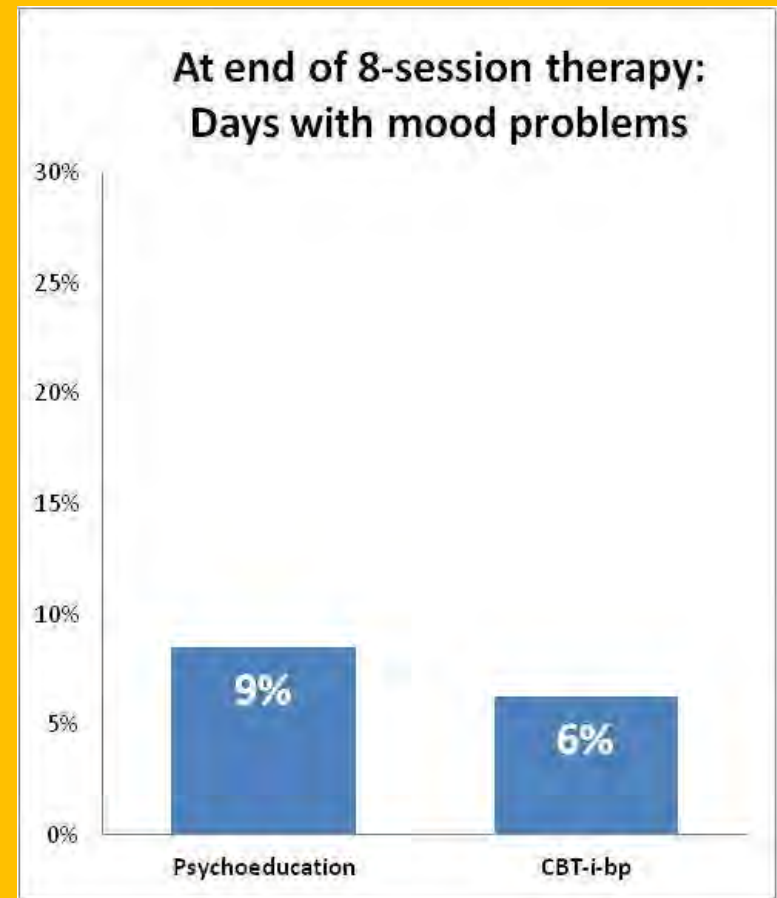
- 3 Yes, in animal studies, large epidemiologic human studies, and controlled studies in winter depression

Esakia et al, 2019

5 Month Educational Group Therapy for Bipolar

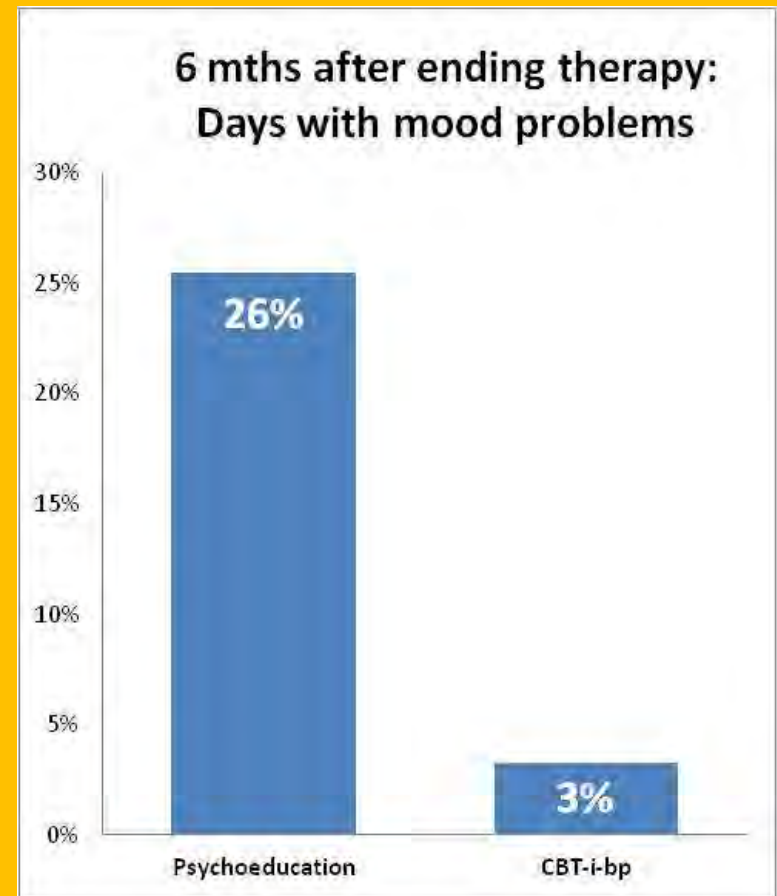


CBT-i bipolar



Harvey et al, 2015

CBT-i bipolar



Harvey et al, 2015

Evening Wind Down

Sundown

Dim the lights

Dim the screens (f.lux app)

30 min before bed

Electronic free zone

Darkness or warm, yellow light

Colder temperature

Meditative activity

Stretching, muscle relaxation

Calming music

Lavender, jasmine



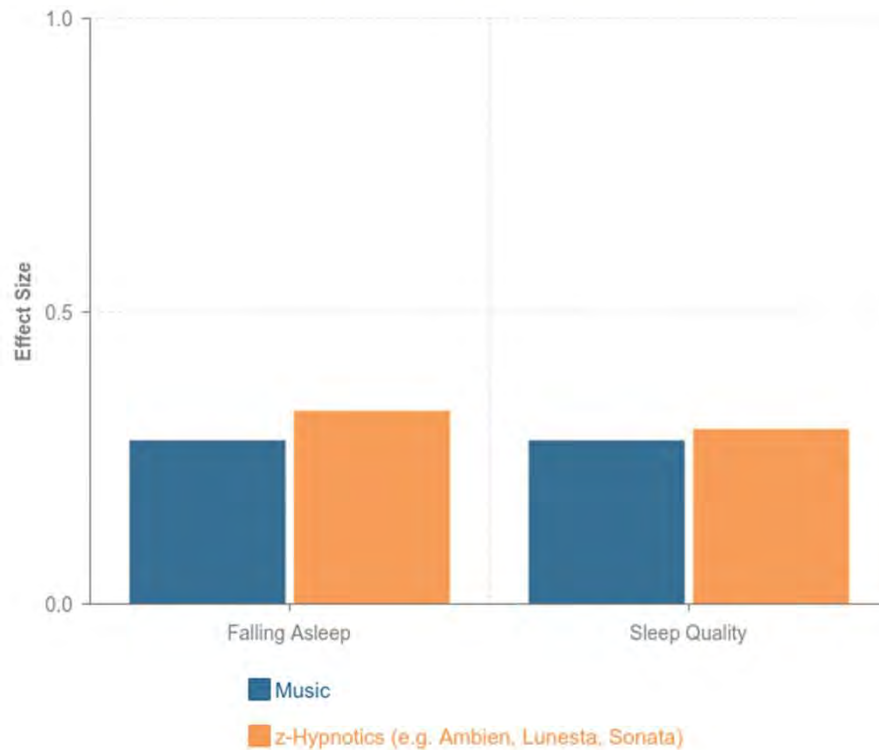
Music for Sleep

Try and see what works:

- *Weightless*, by Marconi Union
- *Binaural beats* (5-7 Hz, theta)
- Regular rhythm, bass tones, tranquil melodies, slow tempo (60-80 BPM; songbpm.com)
- Classical, celtic, Gregorian chant, New Age, Indian or Chinese Classical, electronic
- Familiar songs without lyrics
- White noise and pink noise (nature sounds)



Music vs. Sleep Meds



Better than Audio Books

- 1 Music was compared to audio books, acupuncture, exercise, progressive muscle relaxation, and sleep hygiene

Sleep Meds > Placebo > Wait list

- 2 > Sleep meds helped people fall asleep 22 minutes faster than placebo
> Placebo helped people fall asleep 17 minutes faster than wait list

Two Meta-analyses

- 3 Hypnotics: 4,378 subjects (Huedo-Medina et al, 2012)
Music: 1,339 subjects (Feng F et al, 2018)

Light at Night (LAN)

Obesity

Diabetes

Cancer (breast, prostate)

Cardiovascular disease

Neurologic diseases

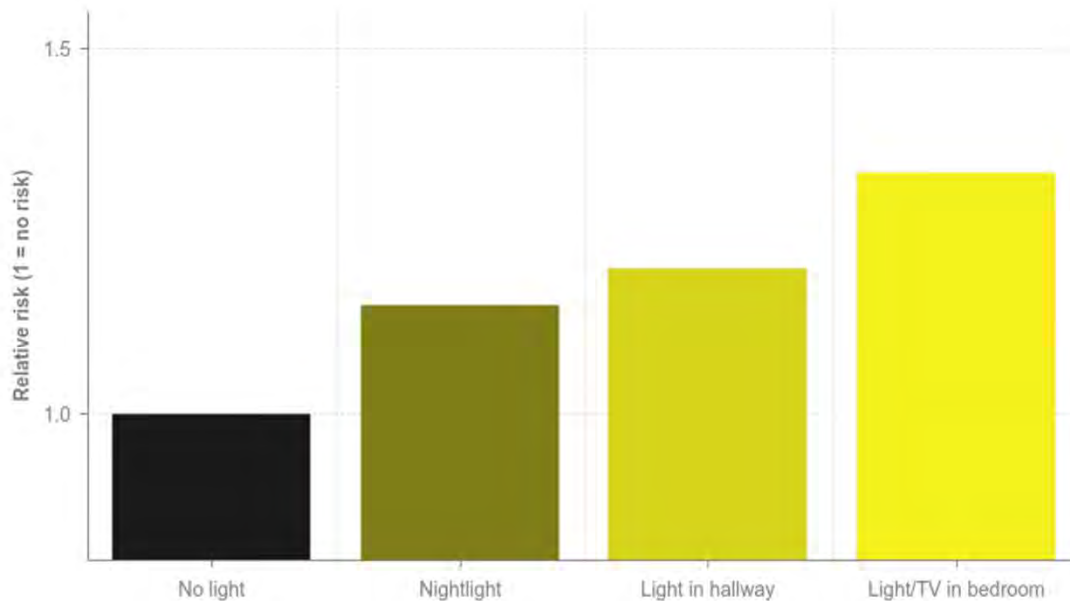
Gastrointestinal ulcers

Adverse reproductive outcomes



Evening Light Causes Obesity

Obesity Risk and Bedroom Light



Park et al, 2019

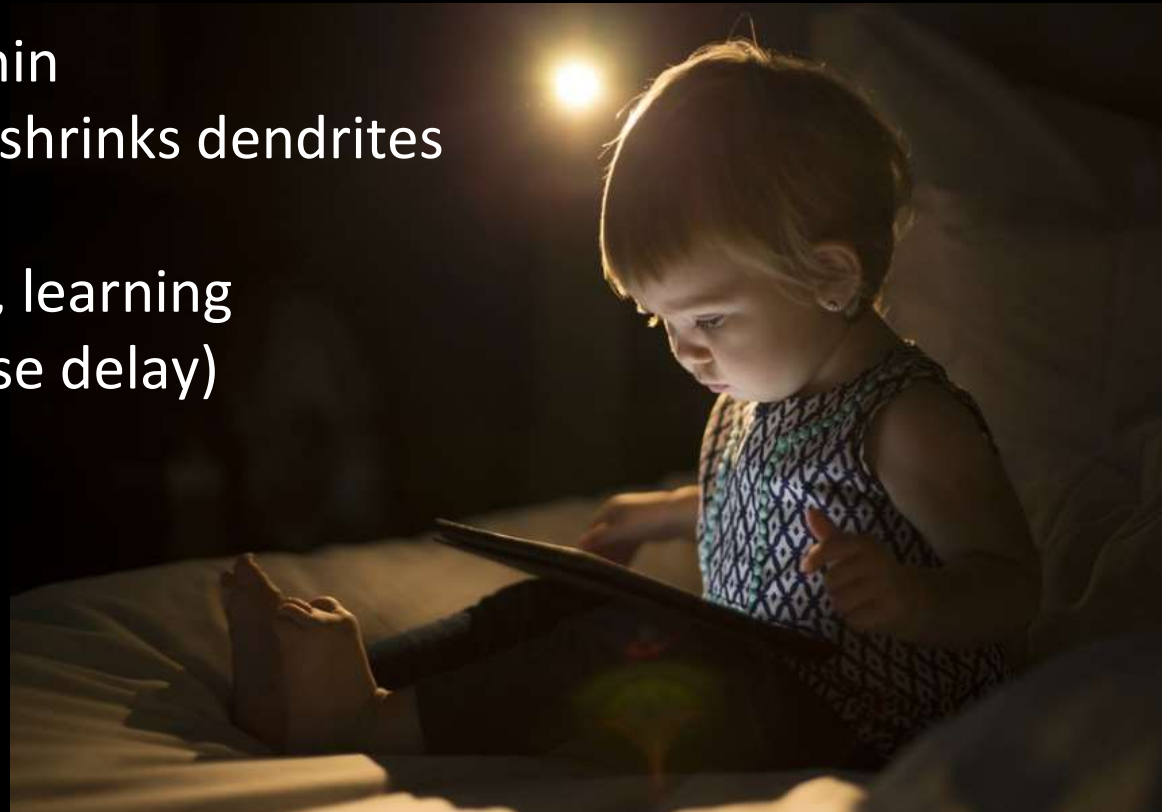
- 1 Large study, long follow up**
44,000 women age 35-74 followed for average of 6 years
- 2 Uncontrolled but adjusted for**
Age, race, location, education, income, family size, menopause, stress, depression, and use of nicotine, alcohol, caffeine.
- 3 Replicated finding?**
Yes, in animal studies and several large cross-sectional human studies.

Light at Night (LAN)

Delays, reduces melatonin
Impairs neuroplasticity, shrinks dendrites

Impairs sleep, cognition, learning
Creates night-owls (phase delay)

Obayashi K et al, *Am J Epidemiol.* 2018



Even dim light...

Bedroom light above 5 lux associated with double the risk of depression after 2 years.

The brighter the light, the greater the risk.

(Obayashi, 2018, Longitudinal study of 863 older adults)



Melatonin = Circadian Rhythm

- *Melatonin* rises in darkness and shuts down with sunrise.
- *Blue light* blocks melatonin.



Glasses



Uvex Ultraspec 2000,
S0360X , \$7 on Amazon

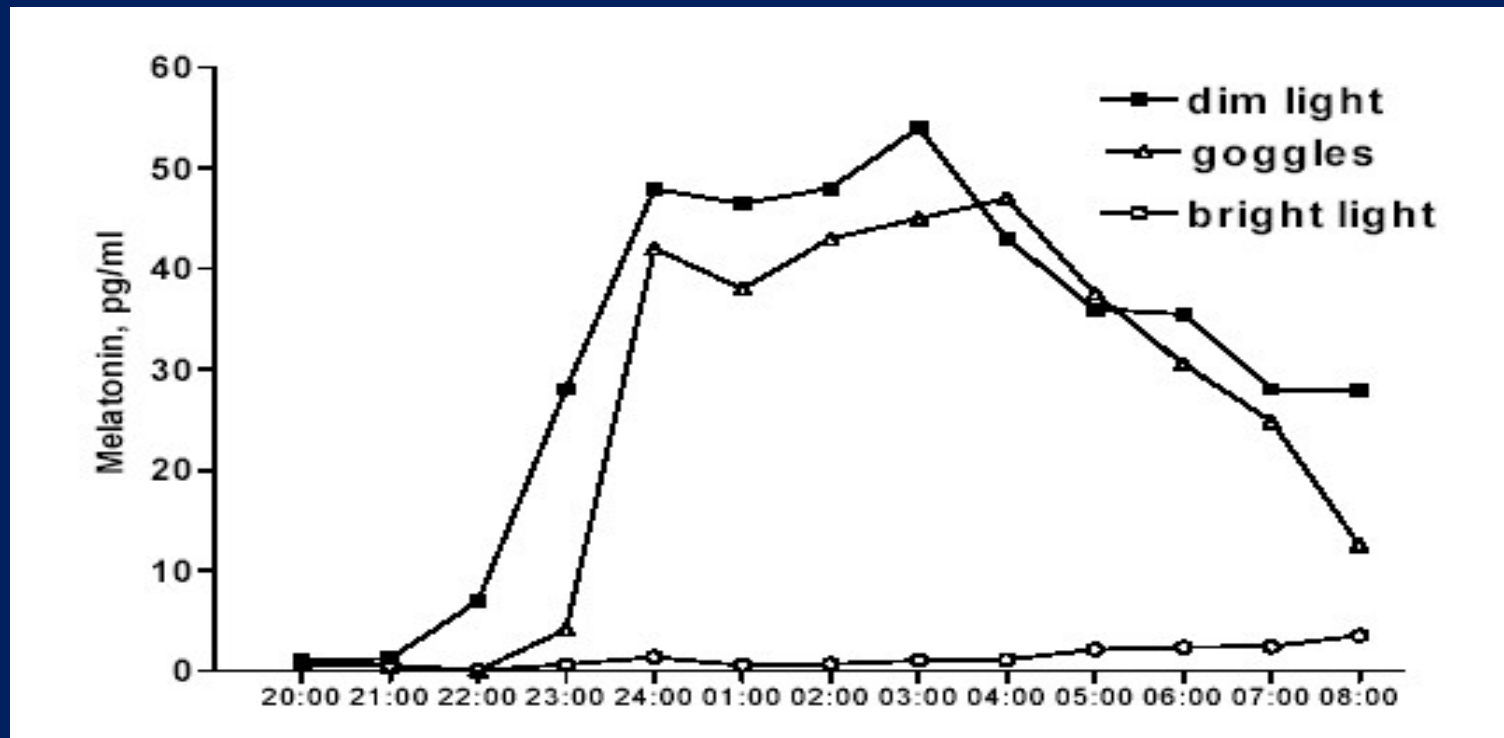


Uvex Skyper 3S1933X
\$7-10 on Amazon



Lowbluelights.com
\$70-80

Melatonin Rises with Dim Light or Blue-Light Filtering Glasses



Kayumov et al. *J Clin Endocrinol Metabolism*, 2005

Black out

- Blackout curtains (such as ShiftShade, or buy blackout fabric, attach with pins or Velcro)
- Aluminum foil against window
- Electric tape over LED lights
- Sleep in basement

Low blue nightlights:

- Maxxima MLN-16 Amber LED Night Light Plug
- SCS Nite-Nite Light Bulb or Sleep-Ready Light
- lowbluelights.com, somnilight.com
- Apps: f.lux, Apple Nightshift mode, Kindle Candle



Blue Light Filters

Computers

Windows: f.Lux

Mac: *Candlelight* by Oliver Denman

Smartphones, Tablets

Apple *Nightshift mode*

Kindle *BlueShade*

Android *Twilight* and *Blue Light Filter* app



Temperature & Sleep



- Drop in temperature signals sleep. A Rise signals wake.
- Sleep in a colder room (60-65°F)
- For morning, program thermostat to increase temp.