Lighting for Longevity:

Using circadian lighting to transform Senior Living

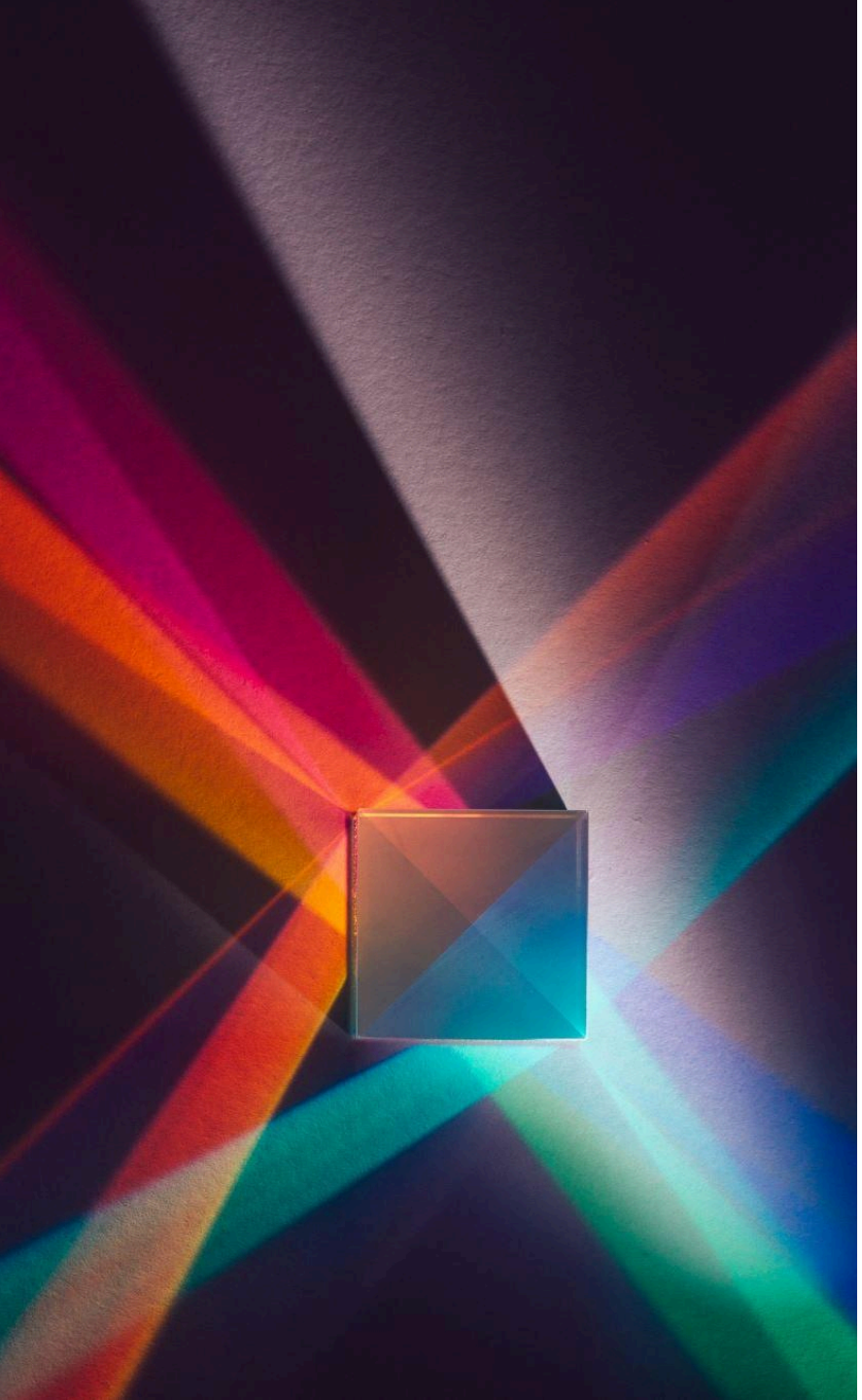
Improving wellness, sleep, and quality of life

Key concept:
Light and dark, we need both

Both light and dark are essential to good health

Quality darkness is needed

People often experience too little of both



Lighting characteristics affecting the circadian system

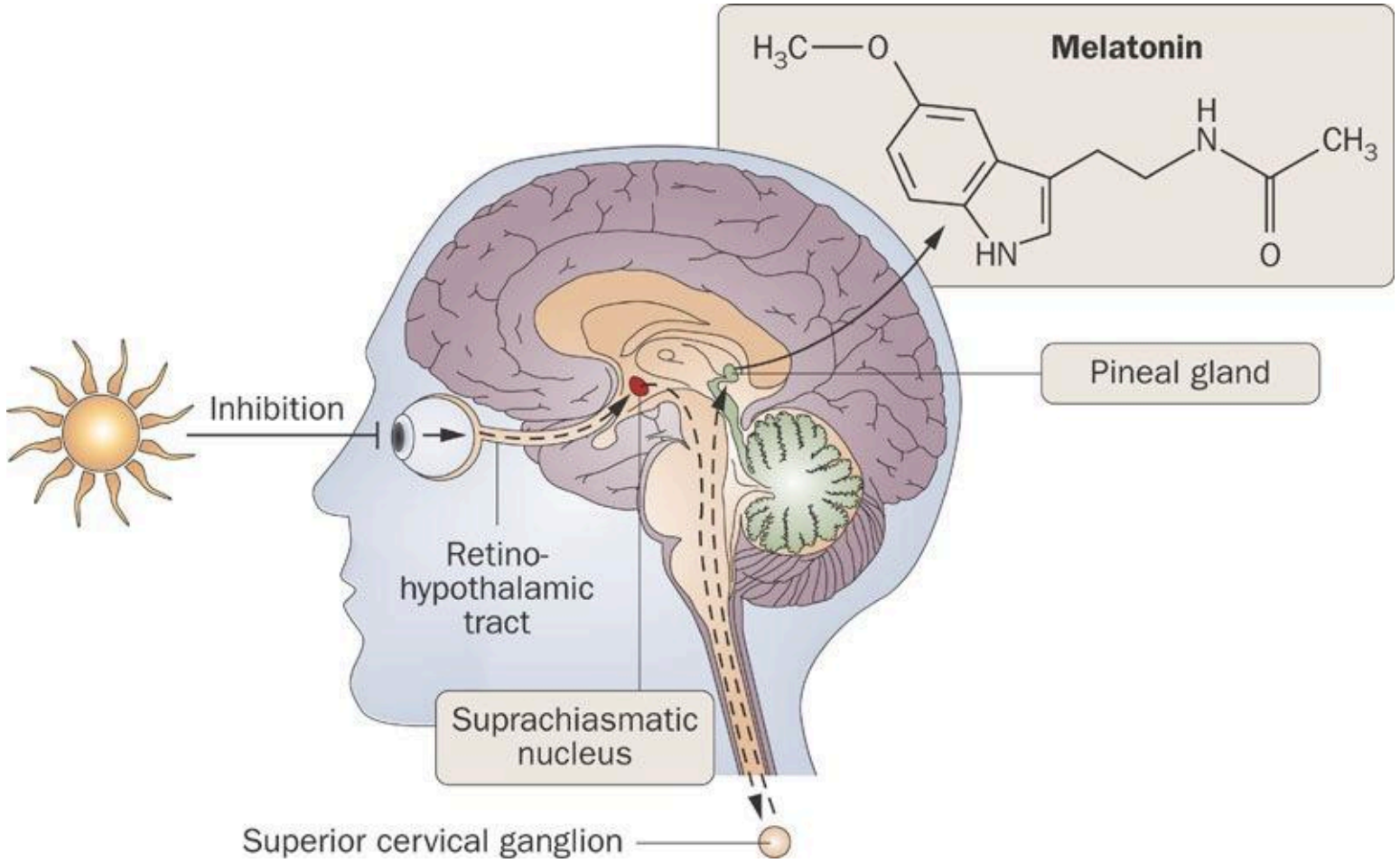
Light of the **right** intensity and **spectrum**, applied at the right **time** and for the right **duration**, will drive the circadian rhythms

Factors determining the effectiveness of light exposure for the circadian system:

- **Quantity** of light
- **Quality** of light
- **Spectrum** of light
- **Timing** of exposure
- **Duration** of exposure

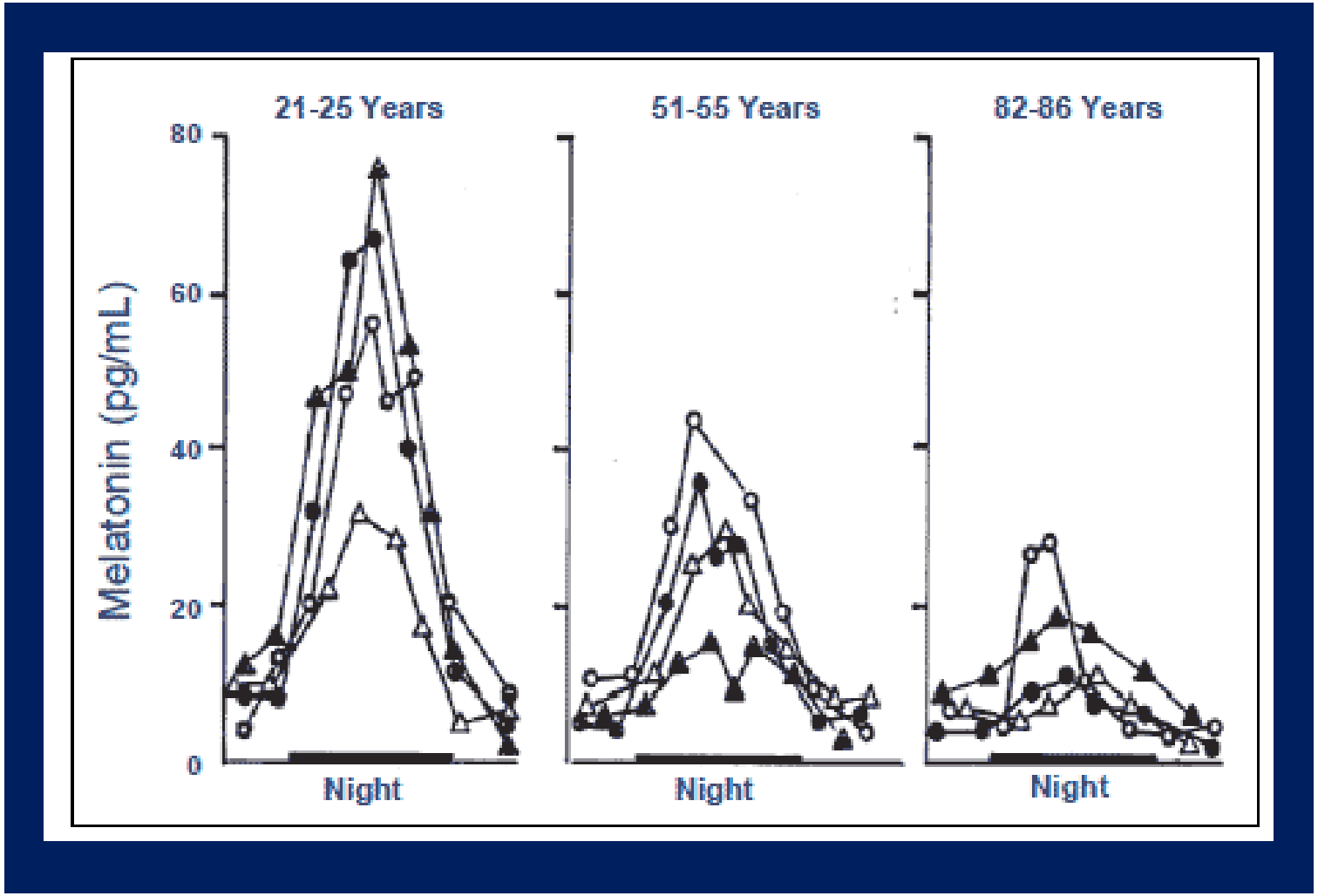
The Science: Why It Works

- **The Mechanism:** Specialized cells in the eye are non-visual receptors that send signals directly to the brain's hypothalamus to regulate hormones like cortisol (alertness) and melatonin
- **Sleep Consolidation:** Properly tuned lighting can halve sleep disturbances
- **Behavioral Health:** Studies show significant decreases in agitation and depression for those with dementia
- **Safety:** A major study found that dynamic lighting systems helped reduce falls by as much as 43%



Melatonin

- Highest levels are produced at night
- Regulates activity-sleep cycle and body temperature
- Healthy melatonin production can suppress cancer and cell growth
- Reduced levels can negatively influence circadian rhythm
- Is not adversely affected by daytime light exposure
- Production is reduced by nighttime exposure to light, particularly blue light



Staff

- **Exposure to light** increases impulse control, pleasure and alertness
- Circadian rhythm disruptions occur from **lighting and changes in work schedules**. These often result in increased daytime sleepiness, insomnia, upset stomach, irritability and mild depression
- **Adaptation to night shift work** is possible with timed light exposure at night and light avoidance by day
- **Quality of Care:** A calmer, more well-rested resident population is easier to support and provides a more rewarding work environment for caregivers.

Timing For Each Color Temperature

Suggested timing schedules

7 am – 4 pm: 6500K @100% output

4 pm – 7 pm: 4100K @100% output

7 pm – 8 pm: 2700K @20% output

Nightlight option: 2400K

Alternate suggested timing schedule

Time of Day	Phase	Color Temperature (Kelvin)	Light Intensity (Output)	Goal
07:00 – 10:00	Morning Ramp	3000K → 5000K	Low → High	Wake up the internal clock.
10:00 – 14:00	Peak Day	5000K – 6500K	High (Max)	Maximum alertness & vitality.
14:00 – 18:00	Afternoon Fade	5000K → 3000K	High → Medium	Gentle transition; maintain energy.
18:00 – 22:00	Evening Warm	3000K – 2700K	Medium → Low	Prepare for rest; relax.
22:00 – 07:00	Night Mode	2200K – 2700K	Very Low	Minimal disruption to sleep.

THANK YOU!!!

Questions?
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