# How Coloured Light Affects Us

Blue · Red · Green — effects on mood, mental health, sleep & the body

## ■ Blue Light

### Sleep

- Strongly suppresses melatonin production — even 2 hours of evening exposure can delay the circadian rhythm by 1.5–3 hours.
- The brain interprets blue light as midday sunlight, keeping the body in daytime mode.

### Mood & Mental Health

- Increases alertness and cortisol — beneficial in the morning, harmful in the evening.
- Chronic exposure (screens) is linked to anxiety, irritability, and depressive symptoms.
- Poor sleep driven by blue light disrupts emotional regulation over time.

### Physical Health

- Prolonged direct exposure may damage retinal cells.
- Disrupted sleep triggers systemic inflammation and weakens immune function.
- Associated with metabolic dysregulation — elevated risk of obesity and cardiovascular disease through hormonal disruption.

## ■ Red Light

### Sleep

- Minimally affects melatonin — the brain does not interpret it as a daytime signal.
- Ideal for evening lighting; supports a natural transition toward sleep.

### Mood & Mental Health

- At low intensity: grounding and calming.
- At high intensity or in an all-red environment: may heighten arousal or aggression depending on context.

### Physical Health (Red Light Therapy)

- Wavelengths 630–850 nm stimulate mitochondrial ATP production.
- Demonstrated anti-inflammatory effects and accelerated tissue repair.
- Supports muscle recovery and may improve skin health.
- Evening use is associated with improved sleep quality.

## ■ Green Light

### Sleep

- Moderately suppresses melatonin — significantly less than blue light.
- Low-level evening exposure is generally well tolerated.

### Mood & Mental Health

- The human eye is most sensitive to green — it is the least visually fatiguing colour.
- Associated with calm and psychological balance; strongly linked to biophilic responses (nature, trees, open spaces).
- Harvard research found a narrow green band (~530 nm) significantly reduces migraine intensity and chronic pain perception.

### Physical Health

- Less phototoxic to the retina than blue light.
- Positive mood effects via nature association may support stress regulation and autonomic balance.

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### Practical Summary

| Light | Morning | Evening | Key note |
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| ■ Blue | ■ Activates & energises | ■ Disrupts melatonin | Avoid screens 1–2 h before bed |
| ■ Red | Neutral | ■ Ideal — sleep-safe | Therapeutic at 630–850 nm |
| ■ Green | ■ Gentle activation | ■■ Mild — use sparingly | Best analgesic / calming spectrum |

Key principle: Light spectrum is a temporal signal for the brain — one of the strongest synchronisers of the circadian rhythm, more potent than food or exercise. Managing your light environment is one of the highest-leverage levers for sleep, mood, and long-term health.

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*Sources: Harvard Medical School · Journal of Biological Rhythms · Photobiomodulation, Photomedicine and Laser Surgery · PNAS (Burstein et al., green light & migraine)*