OPTOMETRIC Management SYMPOSIUM

Embracing the Dawn of Blue Light

Clinical Strategies to Protect Your Patients

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Jennifer Stewart, OD

- Chief Vision Officer: OD Perspectives
- Co-founder/Chief Vision Officer: Performance 20/20
- Executive Board: International Sports Vision Association
- Professional Affairs Team: Coopervision
- Speaker/KOL: MacuHealth
- Sports Vision Consultant
- Delegate, NECO Alumni Board of Directors
- Adjunct Assistant Professor: NECO
- Theia Award for Innovation 2019 – Women in Optometry
- Emerging Leader Award: Optical Women's Association

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"From the moment people get up until the time they go to bed again – including when they are eating, exercising and reading – they are using one digital device after another and thus exposing themselves to risks related to prolonged exposure to light emitted by screens."

- *Mike Daley, Former CEO Vision Council*

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UV versus Blue Light

Which is more damaging and harmful to the eye:

UV Light or Blue Light?

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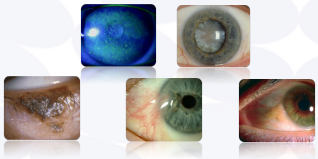
UV Light

- Defined as: electromagnetic radiation with wavelengths of 10nm to 400nm (longer than X-rays, shorter than visible light)
- Blocked by the cornea and lens
- No sunglass police!
- UV light causes:
  - Cancers of ocular adnexa
  - Pytergia
  - Pinguecula
  - Photokeratitis
  - Cataracts



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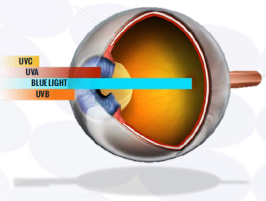
What Is Blue Light?

- HEV (high energy visible light)
- Short wavelengths, higher energy
- Penetrates deeper into the eye



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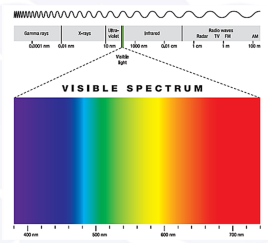
- Blue light is part of the visible light spectrum (400-500nm)
- Digital devices/LED lights emit from 430 to 500 nm (spike around 455nm)



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Ocular Light Transmission

- Cornea absorbs wavelengths below 300nm
- Lens absorbs wavelengths less than 400nm
- Retina absorbs light over 400 nm
- Ocular exposure to light around 435nm (+/-20nm) can induce irreversible cell death in the RPE

https://www.optometrytimes.com/view/blue-light-why-it-matters

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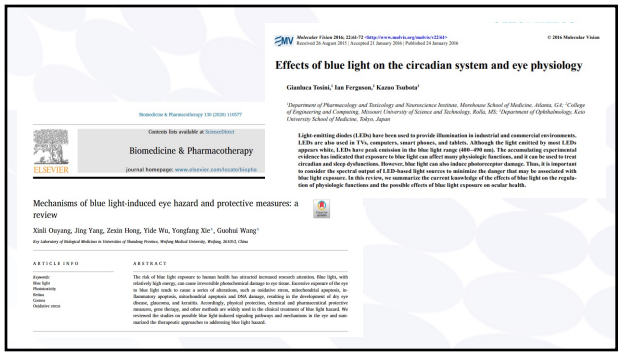

Effects of blue light on the circadian system and eye physiology

Gianluca Tosini,[1] Ian Ferguson,[1] Kazuo Tsubota[2]

Biomedicine & Pharmacotherapy

Mechanisms of blue light-induced eye hazard and protective measures: a review

Xinli Ouyang, Jing Yang, Zexin Hong, Yide Wu, Yongfang Xie*, Guohui Wang*

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Research progress about the effect and prevention of blue light on eyes

Zhi-Chun Zhao[1,2], Ying Zhou[2], Gang Tan[2], Juan Li[2]

Exposure to excessive blue LED light damages retinal pigment epithelium and photoreceptors of pigmented mice

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Sources of Blue Light

- Sunlight (largest source)
- CFL (compact fluorescent light) bulbs
- LED (light emitting diode) bulbs
- TVs
- Computer monitors
- Smart phones
- Tablet screens

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Blue Light- benefits?

- Boost alertness
- Helps memory and cognitive function
- Regulates circadian rhythm
- Sunlight needed for growth and development of eyes/vision

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Blue Light Exposure

MAY result in:

- Damage to the retina
- AMD/cataracts
- Melatonin suppression/sleep disruption

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Sleep

Excessive blue light exposure MAY result in:

- Impact to circadian rhythms
- Trouble sleeping
- Waking during the night
- Reduced alertness the next day
- Reduced productivity/concentration

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Harvard Health Publishing
HARVARD MEDICAL SCHOOL

STAYING HEALTHY

Blue light has a dark side

July 7, 2020

What is blue light? The effect blue light has on your sleep and more.

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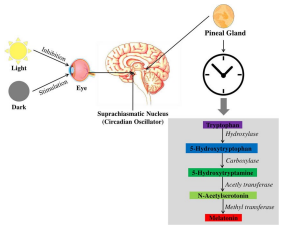
Blue light and melatonin

- In the absence of blue light, ganglion cells in the retina stimulate the pineal gland to release melatonin
- Blue light suppresses melatonin production
- Suprachiasmatic nucleus- "Master Clock of the Brain"



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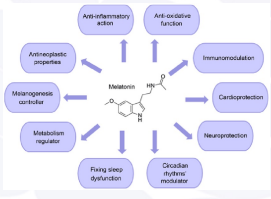
Melatonin

- Helps regulate circadian rhythm
- Synchronizes our sleep/wake cycle with night and day



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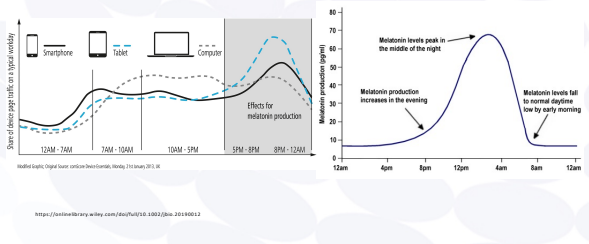
Melatonin/Circadian Rhythm



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Smartphone Use By Generation

- Millenials (born 1981 and 1996): 3.7 hours/day
- Gen X (born 1965 and 1980): 3 hours/day
- Boomers (born 1946 and 1964): 2.5 hours/day

www.entrepreneur.com

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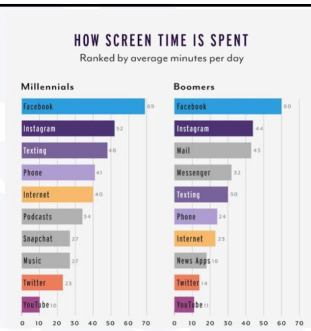

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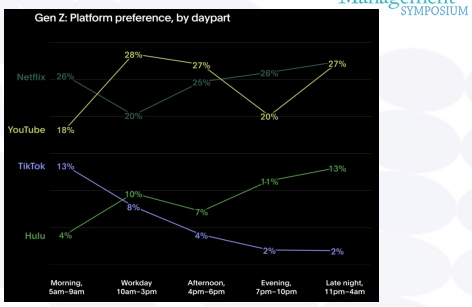

LA Times

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Impacts of Blue Light-?

- Retinal health (AMD)
- Daily vision – glare (light scatter) and blurred vision (chromatic aberration)
- Overall well-being (sleep, chronic health issues)

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Eye Strain?

- 49% of American adults don't know what digital eyestrain is
- >80% of adults use a screen for 2+ hours/day
- Nearly 67% use 2 or more devices at the same time
- 55% look at a screen within an hour of waking up
- 80% use a screen in the hour before going to sleep

https://thevisioncouncil.org/blog/vision-council-shines-light-protecting-sight-and-health-multi-screen-era

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Adults and Digital Eye Strain- more than eyes!

- More than 60% of American adults report digital eye strain symptoms!
  - Neck/shoulder pain (35 percent)
  - Headaches (27.7 percent)
  - Eye strain (32.4 percent)
  - Blurred vision (27.9 percent)
  - Dry eyes (27.2 percent)

https://thevisioncouncil.org/blog/vision-council-shines-light-protecting-sight-and-health-multi-screen-era

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Opportunity!

- 68.5% of Americans do not discuss their digital device use with their eye care provider
- 78.3% of parents are concerned about the impact of digital devices on their children
- Only 29.1% of children have an annual comprehensive exam as part of their back-to-school preparation

Vision Council 2017

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Children and Digital Eye Strain

Kids favorite pastime?

- Digital Device Time (23.1%)
- Watching TV (20.1%)

https://thevisioncouncil.org/blog/vision-council-shines-light-protecting-sight-and-health-multi-screen-era

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Children and Screen Use

After effects?

- Reduced attention span (15.2%)
- Irritability (13.5%)
- Poor behavior (13.3%)
- Eye strain, dry or irritated eyes (9.1%)
- Headaches (8.8%)
- Neck/shoulder pain (5%)

https://thevisioncouncil.org/blog/vision-council-shines-light-protecting-sight-and-health-multi-screen-era

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Solutions

- Blue Light Blocking Lenses (Blutech)
- Blue Light Lens Coating
  - Crizal Prevencia (Essilor)
  - SeeCoat Blue (Nikon)
  - Recharge (Hoya Vision Care)
  - DuraVision BlueProtect UV (Zeiss)

- Supplements (Macuhealth, EyePromise)
- Contact Lenses??

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Implementation

- In Office Implementation
  - Staff and Doctors
    1. All educated
       - online COPE and ABO CE
       - Onsite "Lunch and Learn"
       - All staff and doctors capable of educating patients
    2. All staff wear eyewear – part of the uniform

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Implementation

Setup in practice management system

- Check lab pricing and setup lens price, options, etc. in your system
- Name/Bundle/package strategy
  - Digital protection
  - Blue light protection
  - Indoor protection
  - Outdoor protection

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Implementation

- Blue light questions added to patient history
- Add Blue Light options to 'super bill' or 'routing form'

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Blue Light Questions

Do you use a smart phone or tablet device? **circle Yes or No**

- If yes, for how many hours per day? _____
- Do you use these device(s) at night/in bed? circle Yes or No

Do you often find it difficult falling and staying asleep or find you have more frequent restless sleep cycles?

- **Circle Yes or No**

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Pre-test Strategies

- Macular testing- if applicable
- OCT
- Continue discussing blue light dangers
- Incorporate blue light questions into patient history

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Exam Room

- Discuss retinal scan if applicable
- Continue discussing blue light dangers – relate to lifestyle information gathered in history form
- Prescribe blue light protection

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Optical Strategies

- Optical or Exam Room
  - Handoff from doctor to optician
  - **Optician**
    - Discuss doctor's Rx for blue light protection
    - Demonstrate effectiveness of blue light lenses

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Optical Strategies cont.

- Optical - Blue light practice tools
  - Blue light Lens Demonstrator
  - Blue light laser penlight
  - Patient brochures
  - Blue light symptoms poster
  - Blue light Dispensing Mat

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What Else Can We Do?

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- Annual comprehensive eye exams for adults and children
- Take frequent breaks (20/20/20/20 rule)
- Visual hygiene (posture, lighting)
- Ask good questions!

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Be The Expert!

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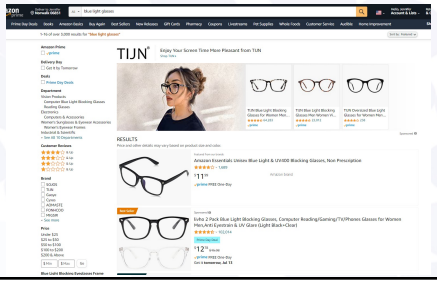

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Blue Light- Summary

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- Understand the impact of blue light
- Understand which patient groups are best suited for blue light protection
- Educate & go through the implementation process with your team using all the tools available

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Questions?

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