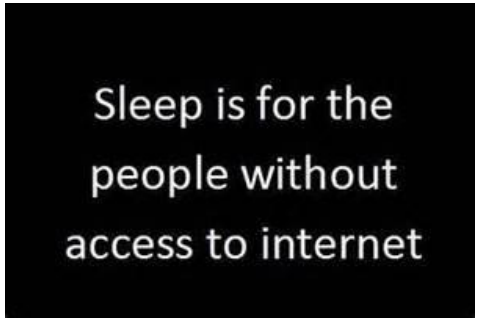
Sleep, Sleep Beautiful Sleep

(Managing sleep in Myalgic Encephalomyeltis/CFS,FM,and MCS)



Diana Monea,Optometrist

Sunday February 9, 2014 1:30-4:30pm

Christ Church 3602 -8th St. SW

Blue LEDs: A Health Hazard?

The Question?

Could a common component used in consumer electronics lead to:

eyestrain,

headaches

disturbed sleep?

Where is “Blue light” found?

On:

mobile phones

PCs

toasters

TV

monitors

air purifiers

medical equipment

electric toothbrushes

and thousands of other products

Other Sources of BLUE Light Include: **Electronic** Devices

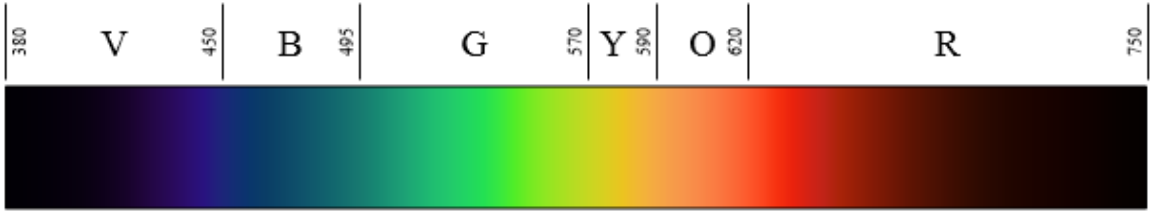
The plethora of **electronic devices** in use today, such as cell phones, tablets, and laptop computers, has dramatically increased our exposure to blue light.

Another source of blue light is energy efficient technology in the form of **fluorescent light bulbs and LED lights**

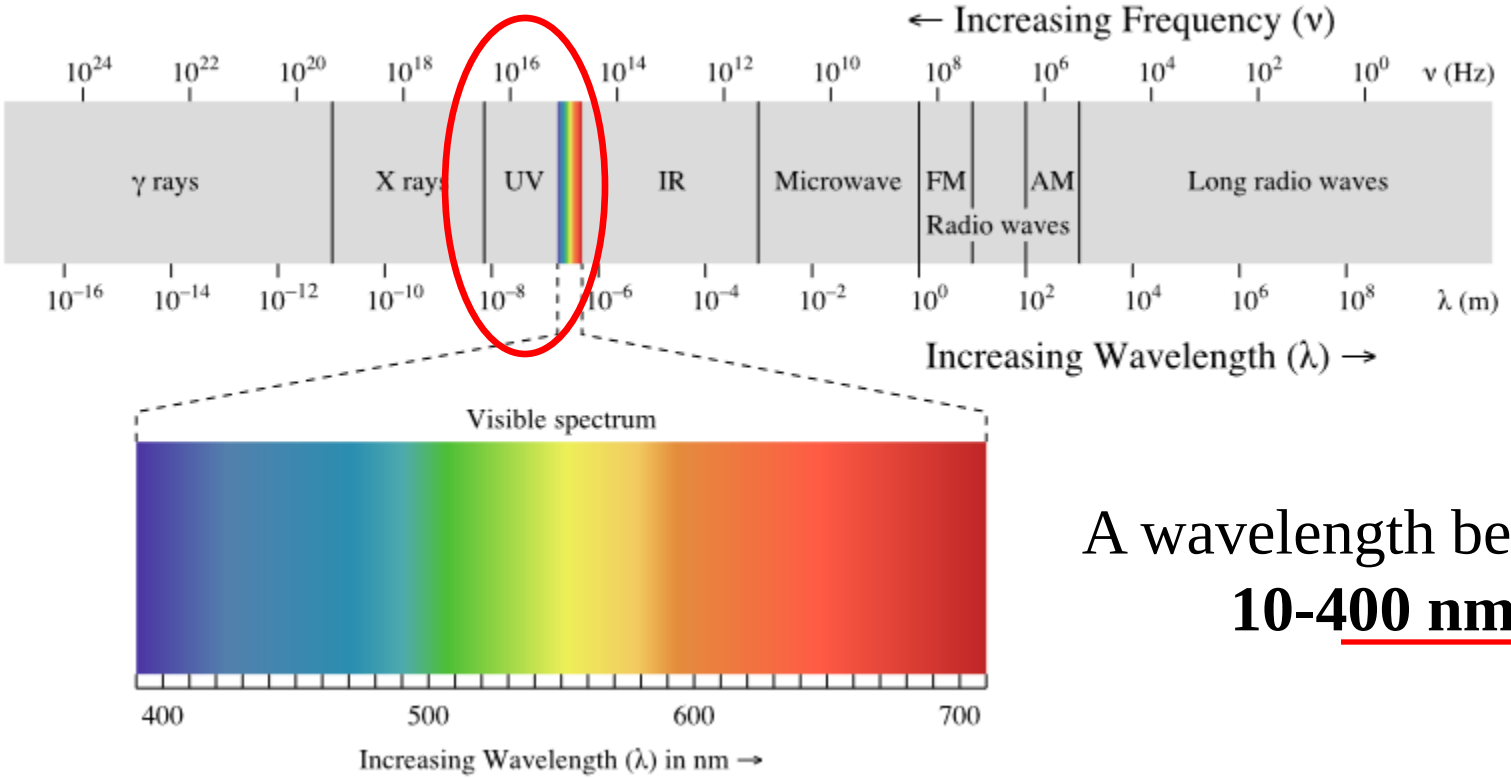
What is **Blue Light**?

Blue is the colour of light **between violet and green** on the visible spectrum.

A wavelength between **450-495** nanometres



What is UV Light?

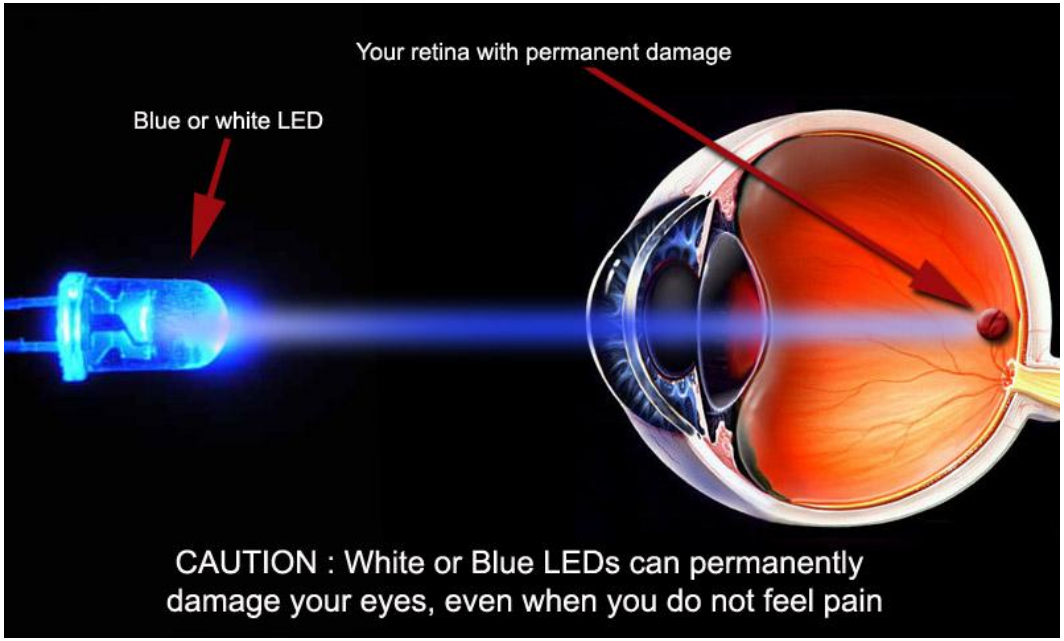


A wavelength between
10-400 nm

UV light is electromagnetic radiation with a wavelength shorter than that of visible light (i.e., shorter than violet/blue light).

Therefore...

100% UV (occurring 10-400 nm) **protection DOES NOT protect against the harmful blue** (occurring 450-495 nm) **light effects on your eyes!**



The Facts about BLUE Light:

Who is at Risk?

Children under the age of 20!

Especially very young children, have little or no **yellowing** of the lens.

Therefore any UV or blue light which enters the eye is unfiltered and strikes the retina at full-strength exposing not only the retina, but the lens causing permanent damage.

Children are 3x at risk for blue & UV light exposure!

What Protects the eye from Blue Light exposure?

Age-related yellowing of the lens: CATARACT and changes in the cornea and vitreous substantially **decrease** the amount of blue wavelengths reaching the retina by middle age.

Damage to Eye from Blue Light Includes:

Cataract

Macular Degeneration

Choroidal Melanoma

Prolonged exposure to **blue light** may permanently damage the eyes, contribute to the formation of **cataracts** and to the destruction of cells in the center of the retina**.** With age there may be a **reduction in the density of the blue light absorbing macular pigment (Lutein & Zeaxanthin)**that protects the macula

How Does “Blue Light” affect Sleep?

These devices emit enough blue light to potentially effect:

- Hormone levels
- **Sleep Patterns**
- Other biological effects.

How is Sleep Affected?

Like insulin and inflammation,

blue light is integral to our health in the correct amounts.

In excess (or too little)

problems arise!

Blue light **regulates**
our secretion of **melatonin**:
the **sleep hormone**.

Exposed to blue light
We limit the production of melatonin.
We stay alert and awake.

Absence of blue light.
Melatonin production ramps up
We get sleepy.

Nighttime exposure to blue light disrupts our sleep hormones.

Television, computer screens, even digital clocks with blue numbers: common sources of late night blue light that can affect

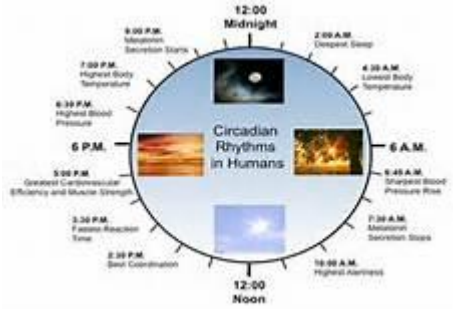
our production of melatonin.

How we respond to "Blue" light.

For years, scientists assumed **circadian rhythm** was set by sight (of light) alone.

That's not how it works.

There is a more dominant system responsible for setting **circadian rhythm (Body Clock)** **(**24 hour cycle in the physiological processes of living beings) is based on light input.



Optical cells express a photopigment called **melanopsin.**

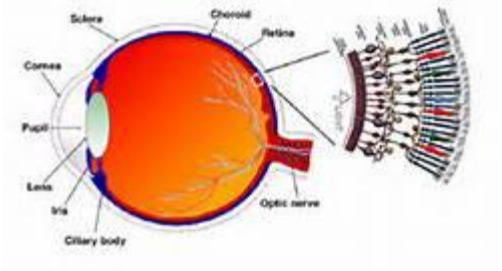
(An opsin-like protein, sensitive to light with a peak sensitivity around 480 nm, and found in the very small proportion of retinal ganglion cells)

Unlike the standard rod and cone, melanopsin doesn't help us see.

It reacts most strongly to blue light.

Scientists think it's the primary regulator of the biological clock and production of melatonin.

Even blind patients with intact melanopsin systems, blue light has a strong effect on their sleep cycles.



Here are some simple steps you can take to mitigate "Blue Light" Affects on your Health:

- Keep electronics usage to a minimum
- Eliminate blue light (alarms, TVs, laptops) after dark.
- Go to sleep earlier.
- Keep your room as dark as possible and your sleeping quarters pitch black.
- Install **F.lux** (totally free) on your computer to cut down on blue light emissions.
- Wear Spectacle lenses with "blue- light" protection

To Date:
Tinted lenses and **Sun Wear** were the only protection from **UV** and **BLUE** light .

Protection from BOTH: **UV and Blue light** was **not** available in a CLEAR lens until recently...

Essilor launches Crizal® Prevencia™

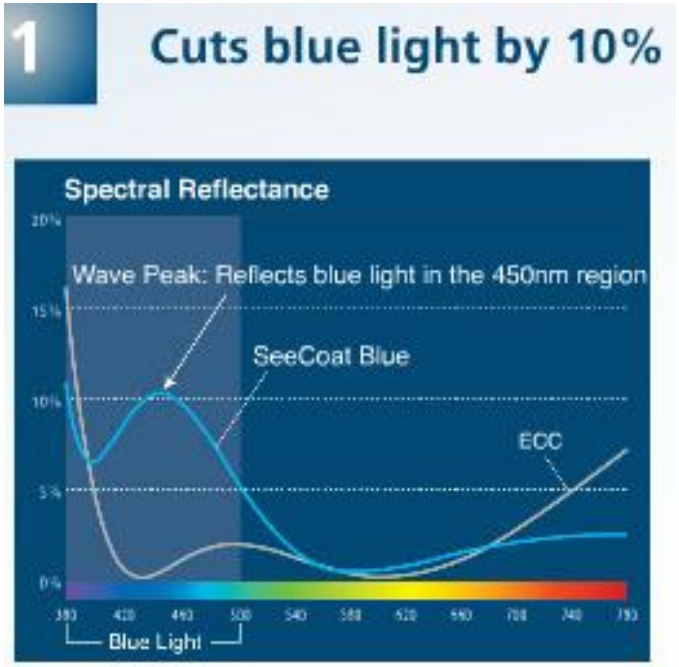
In order to identify the part of the spectrum that is damaging to the human retina, the joint team developed a completely new protocol: an *in vitro* test on retinal cells with narrow screening light exposure to determine the harmfulness of rays depending on their wavelength. This test -a scientific first in ophthalmic optics- allowed for the discovery that wavelengths between 415 and 455 nm (spectral band centered at 435 nm +/- 20nm) are the most harmful for the target retinal cells.

Thus, **BLUE LIGHT** more **harmful** to the **retina** than **UV**!

- by letting beneficial blue light pass through;
- by filtering out harmful blue-violet rays that can contribute to AMD, as well as UV rays, an important cause of cataracts;
- while maintaining the transparency of the lens.

Also Available

SeeCoat Blue by Nikon



Features:

- Enhanced contrast on digital screens
- Reduces level of high energy blue light by 10%

Prevencia™

SeeCoat Blue

A “Patented” Technology
Allowing the beneficial blue light to pass through the lens
while filtering out much of the
harmful blue-violet
and
UV light.
The lens is essentially CLEAR.

Thank You!