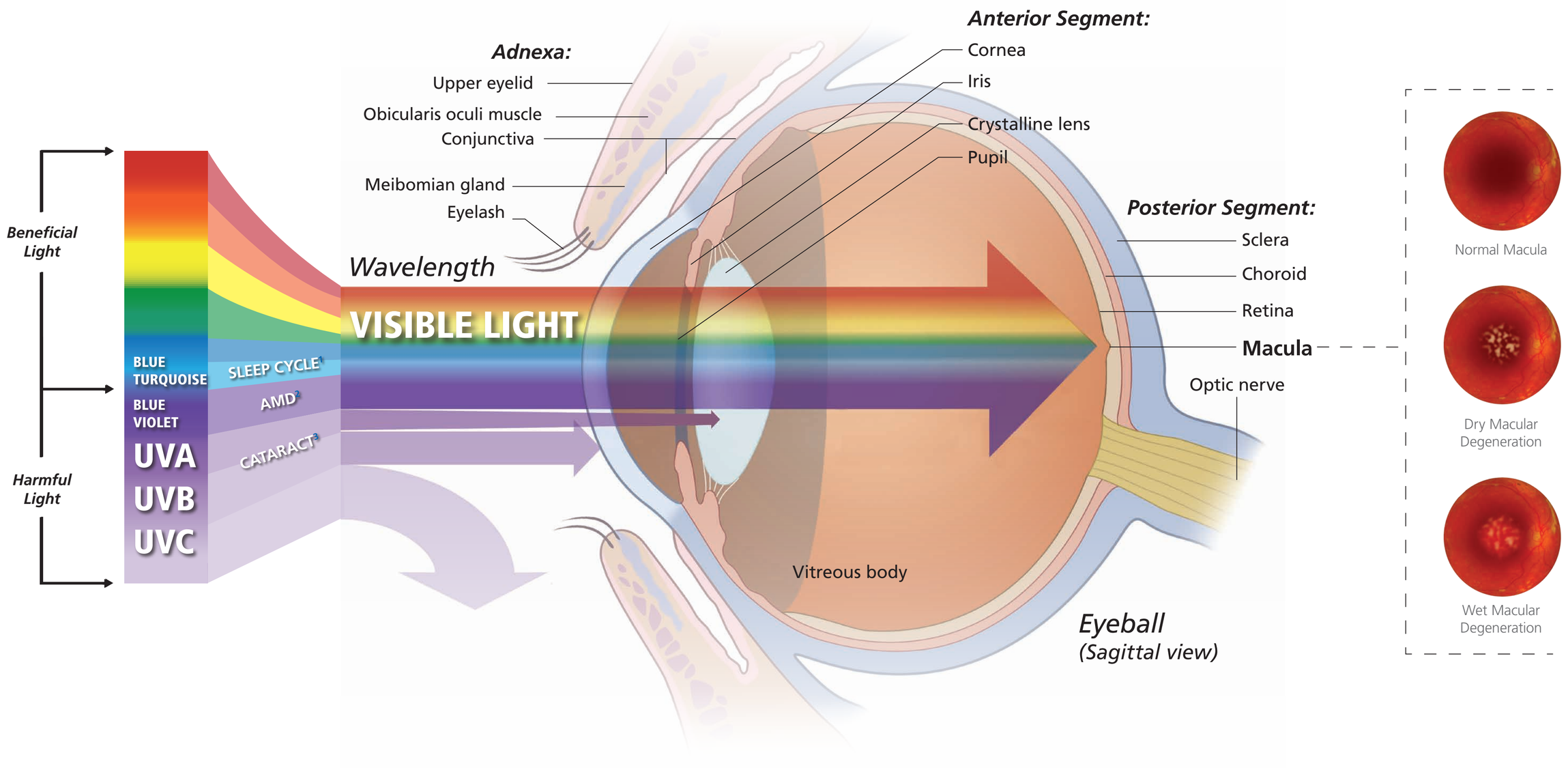
UNDERSTANDING Blue and Ultraviolet (UV) Light



WHAT ARE BLUE AND UV LIGHT?

Blue light is high-energy visible (HEV) light.

- Light waves between 465 and 495 nanometers (nm) contain beneficial, Blue-Turquoise light. This light is beneficial for vision and overall health.
- Light waves between 415 and 455 nm contain harmful, Blue-Violet light. This High-Energy Visible light can induce retinal cell death.*
  *Based on in-vitro tests of swine (pig) retinal cells[4]

UV light is invisible to humans.

- Light waves that are shorter than 380 nm are classified as UV.
- Overexposure to UVA and UVB light can have a negative and often irreversible impact on eye health.
- UVC light is absorbed by the Ozone Layer.

SOURCES OF BLUE AND UV LIGHT:

Blue light and UV light are present all year and in any weather condition (sunny, cloudy, rainy, etc.). Blue light is also emitted from many modern devices including computers, tablets, smartphones and compact fluorescent light bulbs.

BENEFICIAL LIGHT:

Blue-Turquoise light is essential for overall well-being.

It is necessary for both visual and non-visual functions, including visual acuity and color perception, regulation of the sleep/wake cycle, mood, and cognitive performance.

Exposing eyes to this beneficial light daily is important for overall health.

HARMFUL LIGHT:

Blue-Violet light may contribute to retinal damage.

Research has shown that exposure to harmful Blue-Violet light can cause mortality in the retinal pigment epithelium (RPE) cells.[4] Blue-Violet light exposure is a risk factor for age-related macular degeneration.[4]

Age-Related Macular Degeneration (AMD) is a cause of severe vision loss and legal blindness.

AMD is an eye condition that damages the macula, the centermost part of the retina, which controls our central vision.

- AMD is the leading cause of severe vision loss and legal blindness in adults over 60. The progression can range from slow to quick, depending on the individual.
- Exposure to Blue-Violet light is cumulative over a person's life and is one of the risk factors contributing to the early onset of AMD.
- The first symptom can be blurred or distorted vision in one or both eyes.
- Limiting exposure to Blue-Violet light (as well as UV light) whenever possible is a proactive step for protecting eyes.

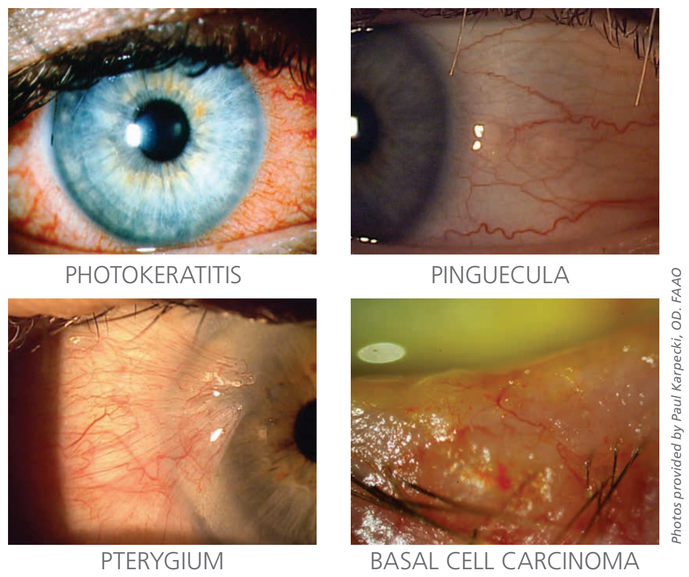
NORMAL VISION | EARLY AMD | ADVANCING AMD | LATE AMD

UV light is a major risk factor for cataract.

Long-term exposure to UV light can damage the surface of the eye (Adnexa), as well as its internal structures.

Exposure to UV light increases the risks of certain eye conditions and diseases.

Photokeratitis, Pinguecula, Pterygium, Cancerous skin growths on the eyelids, brow and conjunctiva.



PHOTOKERATITIS | PINGUECULA

PTERYGIUM | BASAL CELL CARCINOMA

Photos provided by Paul Karpecki, OD, FAAO

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1.Berson DM. Phototransduction in ganglion-cell photoreceptors. Pflugers Arch – Eur J Physiol. 2007;454:849-55. 2.Taylor HR, West S, Munoz B, Bressler SB, et al. The long-term effects of visible light on the eye. Arch Ophthalmol. 1992;110:99-104 [FN 51]. 3.Foster A. Vision 2020: The Cataract Challenge. Community Eye Health. 2000; 13(34): 17-19. 4.Arnault E, Barrau C, Nanteau C, et al. Characterization of the blue light toxicity spectrum on A2E-loaded RPE cells in sunlight normalized conditions. Poster presented at: Association for Research and Vision in Ophthalmology Annual Meeting; May 5-9, 2013; Seattle, WA.

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