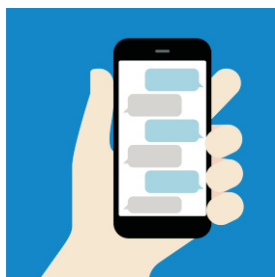


*Macular degeneration leads to central vision loss. Imagine not being able to see your child's face or even read a book.*

# PREVENT THE GRADUAL SIGHT LOSS



## FROM MACULAR DEGENERATION

## ASK US HOW

### 3. Finer points

**Light reflects** off of objects and enters the eyeball. The energy of that incoming light is absorbed by photoreceptors triggering a biochemical message that relays an electrical impulse to the brain's visual cortex, where vision occurs.

**The retina** is a vast network of photoreceptors that collects light's energy. The peripheral retina is comprised primarily of rods. These receptors are extremely sensitive to small amounts of illumination and provide scotopic (low light) viewing and contributes to peripheral vision.

**The macula** is a 4mm oval in the direct line of sight. It possesses the highest concentration of retina cones, perhaps as many as 6,000,000, each with an individual nerve fiber connection to the brain. While it comprises only 4% of the retina, the macula is responsible for a majority of photopic (daylight) vision. It is responsible for the perception of color and fine detail, like face recognition and reading. It is the only part of the retina that can deliver 20/20 visual acuity.

**The retinal pigment epithelium (RPE)** is a single layer of hexagonal cells that are densely packed and heavily pigmented located at the back of the globe. The tips of the photoreceptors connect to the RPE where nutrients are delivered and metabolic wastes are removed. The RPE maintains the health and function of

In addition, the RPE improves optical clarity and reduces chromatic aberration by the absorption of easily scattered blue light. Levels of lutein and zeaxanthin, the primary blue light absorbing carotenoids (pigments), have been found to be 35% lower in MD patients.

**The proliferation of electronics** and energy efficient lighting has led to dramatic increase in exposure to blue light, especially at night. High energy blue-violet (400- 455nm) light (HEV) is photo-tonic. Excessive exposure overwhelms retinal carotenoids and leads to oxidative changes damaging the RPE and the photoreceptors leading to a gradual but irreparable sight loss.

With continued exposure the RPE can thin, not moving nutrients and waste back and forth as efficiently. Waste builds up and the cells in the macula becomes damaged, affecting your vision. The reduced capability to absorb blue light and to compensate for oxidative damage are important factors initiating the chain of events that lead to the onset of macular degeneration (MD).

**Dry MD:** is characterized by a degeneration and thinning of RPE and collateral loss of neighboring photoreceptor cells. Some cases progress to the wet form.

**Wet MD:** Neovascular MD is characterized by abnormal growth of capillaries from the choroid into the RPE and by the subsequent discharge of fluid and blood damaging the photoreceptors. Wet MD represents 10% of all cases but 90% of all sight loss.

**Macular degeneration** is a leading cause of vision loss in Americans 60 and older. 2,700,000 Americans will develop dry MD and 210,000 will develop wet MD each and every year between now and the 2050.