HEALTHY INSIGHTS®

Issue 4, September 2009

Newsletter brought to you by Transitions Optical

>> Welcome to the Autumn 2009 edition of the InSight newsletter!

These newsletters are intended to provide you with useful information on the latest hot topics in optics and also give you a bit of fun during your coffee break. This edition looks at dangers to healthy sight in children. We also offer an insight into the history of protecting your eyes, as well as a quiz to test your brain!

>> HEALTHY SIGHT IN CHILDREN

Although most parents are aware of the need to protect their child's skin from the sun, the potential damage of the sun on the eyes is far less appreciated. The World Health Organization recommends that children protect not only their skin but specifically recommends children wear sun-protective glasses and that these precautions should be taken at all times:

"Sun protection is not only necessary on the beach or at the swimming pool, but applies to all outdoor settings."

>> Protection from the Sun

UV-related

There are many sources of risk for ocular damage in children, but perhaps the most well known is ultraviolet (UV) radiation from sunlight. UV rays can have serious consequences for the eyes. Indeed, acute UV exposure can cause **photokeratitis** and **photoconjunctivitis**, while exposure to UVB appears to be a risk factor for **cataract development** later in life. Although UV rays are a danger for all eyes, children are especially susceptible to UV damage due to a number of contributing factors:

- **Their crystalline lenses are not fully developed** to adequately filter UV radiation, transmitting more UVR and short-wavelength visible light than adult lenses. The clear lens of a child (<10 years of age) transmits 6.5 times more incident UVR to the retina than an adult lens
- **Children are more exposed to the sun.** The average child receives 3x the annual UV exposure of an adult Starting eye protection at an early age is essential. Cumulative UV exposure over a lifetime may result in ocular problems later in life. Children have more time to develop diseases with long latency, and increased life expectancy further adds to a child's eventual risk of developing ocular problems.

Discomfort of glare

Glare represents an excess of light, and its interference with vision can range from annoyance and discomfort to impairment. Like adults, children also suffer from glare sensitivity and its associated symptoms, especially during their many outdoor activities. Glare can cause reduced vision and contrast sensitivity while also inducing ocular fatigue and asthenopia (eye strain).

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>> Transitions lenses offer both UV and glare protection for kids

Being aware of the potential harm and discomfort that can result from UV and glare makes it easy to understand the considerable benefits offered by Transitions photochromic lenses for children.

- Transitions lenses **block 100% of harmful UVA and UVB rays,** providing constant UV protection
- Transitions lenses **reduce glare by quickly adapting** to changing light conditions, so the eye always receives the correct level of light
- Transitions lenses **provide a single pair of glasses,** with no need to change to sunglasses in most lighting conditions (except in extreme lighting conditions, e.g. snowy day or at the beach), and thus accommodate for the indoor-outdoor lifestyle of children, removing the worry of forgetting to change to the right glasses at the right time.

In glare-prone situations, clear lenses do not provide the same level of visual comfort when compared with tinted lenses. In children and adults, studies have shown that photochromic lenses provided the greatest visual comfort and superior vision-related quality of life, when compared with clear and fixed tint lenses. In addition, it is important to consider the simple comfort benefits of wearing protective lenses that reduce the muscle fatigue associated with squinting.

>> Risk of amblyopia & compliance with corrective lenses

Amblyopia is the most common cause of visual impairment in children, found in as many as **5–7% of school-aged children.** Amblyopia is a reduction in vision that results from altered visual development within the central visual pathways. The critical period for avoiding amblyopia is childhood, from the first weeks of life until about 8 years of age. Any problem that interferes with a focused, fusible image during this time is capable of causing amblyopia.

Children who do not wear their corrective lenses are at risk of developing amblyopia or other visual problems. But not all children who require eyeglasses actually wear them for fear of peer disapproval. So for children who require vision correction, compliance is a serious issue.

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>> Transitions Lenses can aid compliance

Transitions lenses may help to ensure that children comply with their prescription lenses. Studies suggest that photochromic lenses offers advantages over clear lenses in children with respect to peer acceptance and compliance.[1] This compliance is key for healthy sight development and avoiding vision problems like amblyopia.

Transition lenses not only directly aid in vision correction, UV protection and glare reduction, but they can also indirectly aid in ensuring that children adhere to wearing their corrective lenses. And because Transitions lenses are available for almost all prescription types and designs, they present an ideal solution for the many needs and sizes of children.

>> Hot topic!

The need for protecting the eyes from sunlight is ancient! Here is a short history of ophthalmic lenses, from 1000 BC up to today.

1000 BC Sunglasses made from two holes in a whale tooth were used by the Eskimos during the 6 months of sunlight in the Northern regions, to protect from glare and cold winds.

400 BC In Plato's dialogue Phaedo, where Socrates discusses the immortality of the Soul, he also invites his readers not "to look directly at the sun, but at the light reflected in a pool" to avoid damage to eyesight.

20 AD The ancient tragedian Seneca, born in about 4 BC, peers through a glass globe of water, which magnifies "all the books in Rome" for his reading pleasure.

1000 AD Forget the glass globe of water. About this time the "reading Stone", an early version of the magnifying glass, is developed.

Late 13th century No one knows for sure who invents the first true spectacles, but it's around this time, and it's definitely an Italian. Some say Salvino degli Armati of Florence or Alessandro Spina of Pisa. It's up for speculation.

1352 Tommaso da Modena paints the first known artistic representation of eyeglasses on the portrait of an elderly churchman in the dome of Treviso (Italy). Artists will go on to paint eyeglasses on personages such as St. Peter, even though he was dead long before eyeglasses came to exist.

Late 14th century Early eyeglasses are made of valuable rock crystal quartz, but soon counterfeit lenses made of glass begin to appear. Eventually, better grades of glass are used to make higher quality spectacles to meet the growing demand.

1430 Italy introduces vision-correcting eyeglasses to China, where they are darkened, not to ward off evil spirits, but to conceal judges' eye expressions in court.

1456 Gutenberg invents the printing press and suddenly everybody needs reading glasses – not just people in monasteries or wealthy households but common people too.

Late 15th century The first spectacles are made of wooden frames with a pivot at the center. They have no arms and sit on the nose in a pince-nez fashion.

Early 16th century Up until now, spectacle makers are only able to grind convex lenses, which correct farsightedness. With the introduction of concave lenses, nearsighted people can have their vision corrected too.

Early 17th century Lens selection is hit-or-miss as the wearer tries on pair after pair until one allows better sight. Finally, the Spanish invent graded lenses.

Early 18th century Basketfuls of spectacles are imported from Europe to America for affluent colonists to dig through until they find the right prescription.

1730 The world standard for spectacles frames is set as a London optician named Edward Scarlett perfects eyeglasses with rigid sidepieces that rest atop the ears.

1775 The concept of combining near and distance lenses into one set of eyeglasses was invented by English optician Samuel Pierce. Later on, in 1784, Benjamin Franklin developed bifocal glasses that are still conserved near the Liberty Bell, in Philadelphia.

1930's The US Army Air Corps commissions the production of a highly effective dark-green tinted spectacle to protect pilots from the dangers of high-altitude glare.

1966 The first photochromic lenses are introduced. They are made of glass containing light-sensitive silver halide crystals mixed into the glass in its molten state. They are activated by UV light from the sun.

1990 Transitions Optical, Inc. successfully commercializes the first plastic photochromic lens using a proprietary new surface-treatment lens technology.

2008 Transitions Optical is still the only manufacturer using photochromic surface technology. This year Transitions introduces its newest and most advanced variable tint lens.

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>> FASCINATING FACTS

Test your knowledge and then use these fun facts to impress your younger patients!

1. Why do frogs blink when they eat?

a. To help them swallow their food
b. To moisten their eye while eating
c. To scare away other frogs

2. Why do dolphins close only one eye when they sleep?

a. To stay alert while sleeping
b. The cannot close both eye at the same time
c. Only one eye has eyelids that can close

3. Why do pirates wear an eye patch?

a. To see better in the dark
b. To cover an eye injury
c. Both of the above

4. Which of these animals have the best night vision?

a. Raccoon
b. Cat
c. Owl

5. Which animal can look in opposite directions at the same time?

a. Camel
b. Chameleon
c. Cat

6. How many eyelids do sharks have?

a. 1
b. 2
c. 3

Answers

1. a (As a frog swallows its prey, the eyes sink through openings in the skull and help force the food down the throat)

2. a (Because dolphins have to be conscious to breathe, they close only one eye and rest only one half of their brain while sleeping. The closed eye switches, on average, every hour, allowing the other half of the brain to rest. This phenomenon is known as 'swim rest' and allows dolphins to watch for predators and avoid obstacle)

3. c (Not only to cover an injured eye! Another theory says that pirates would cover one eye to allow for better vision in dark areas below deck. By switching the eye patch to their other eye, their vision was immediately adjusted to the darkness)

4. c (The eyes of a Tawny owl are the best developed of all vertebrates and are about 100 times more sensitive in low light levels than human eyes)

5. b (A chameleon can look in opposite directions at the same time because their eyes move independently from one another)

6. c (The upper and lower lids of a shark don't move and don't close over the eye, so sharks can't blink. They sometime slide the third inner lid (a thin, tough, translucent membrane) horizontally across each eye to protect the eyes, especially while biting prey and eating. Other animals with third eyelids are chickens and hares)