Having a Vision for Vision: The Invention of the Contact Lens

While we can be sure the Mona Lisa wasn’t wearing contact lenses, her artist Leonardo DaVinci was credited with introducing the idea in 1508. It wasn’t until 1887, however, that a German glassblower, F.A. Muller, produced the first documented contact lens designed to fit over the entire eye. Because Muller’s contact was made of glass, oxygen could not permeate the lens and it could only be worn for a few hours.

In 1936, American optometrist William Feinbloom introduced plastic into contact lens production. By the 1940s, contact lenses were made completely from plastic.

Approximately 125 million people worldwide wear contact lenses.

Centuries in the Making: Contact Lenses Today

Contact lenses have become a popular and effective option for correcting common vision problems, and in many countries they are regulated as a medical device. The evolution of the contact lens has spanned centuries, but the greatest technological advancements have happened in the last few decades.

Notably, the inventions of soft lenses and a daily disposable option have revolutionized a consistently expanding market in the twenty-first century. There are contact lenses for astigmatism (a common eye condition that causes blurred vision) and presbyopia (age-related, decreased ability to see objects up close clearly) or those who want to use lenses to enhance the color or natural beauty of the eye.

Worldwide, the mean age of a contact lens wearer is 31, and 67% of contact wearers are female.

Oh, What to Wear!

The contact lens market offers an array of choices that allow wearers to dispose and replace contacts anywhere from one day to one month. A shorter wear cycle and more frequent use of fresh lenses can improve the wearer experience.

- **Daily Disposable**: One of the healthiest contact lens options available; designed to be worn for one day, removed and discarded. Convenient, because there is no need to clean or store the lenses.
- **Frequent Replacement**: Most commonly prescribed to be disposed of on a two-week or four-week basis. These lenses are taken out every night, cleaned and re-inserted the next day.
- **Overnight Wear**: Some lenses are approved for overnight wear which means they can be worn continuously for a defined period of time. It is important that people who wish to keep their contact lenses in while sleeping first talk to their eye doctor to determine if overnight wear of contact lenses is appropriate for them and to be properly fitted with the right type of contact lens.
How Do They Do That? Innovation in Contact Lens Design

Contact lenses are fitted over the cornea of the eye and correct vision problems by compensating for the shape of the eye, bending the light rays to focus on the retina.\textsuperscript{viii} Innovation in design has allowed manufacturers to address a range of vision problems through lens thickness levels or zones. More specifically:

- **Toric lenses** have two powers in them to correct astigmatism (blurry vision) and either myopia (nearsightedness) or hyperopia (farsightedness) and are designed with curvatures at different angles (depending on condition) that stay in position and do not rotate.\textsuperscript{ix}
- **Spherical lenses** are either concave or convex:
  - **Minus, or Concave lenses** address myopia (nearsightedness) and are thinner at the center than at the edges, spreading light away from the center of the lens to reach the retina.
  - **Plus, or Convex Lenses** address hyperopia (farsightedness) and are thicker at the center and thinner around the edges, bending the light toward the center to reach the retina.
- **Bi-focal lenses** can correct both near and far vision and are usually prescribed for those with presbyopia.

**Did You Know? Material Matters**

- Most contact lenses today are called “soft” contact lenses which are made from hydrogels, a plastic with the ability to hold a lot of water, making them comfortable. A significant technological breakthrough, hydrogels use water to transmit oxygen to the eye.
- Silicone hydrogels followed hydrogels in the late 1990s, and are available in many contact lens products on the market today. They allow nearly 100 percent of available oxygen to reach the open eye.

\textsuperscript{1} Eye Topics (n.d.) The History of Contact Lenses. URL http://www.eyetopics.com/articles/18/1/The-History-of-Contact-Lenses.html

\textsuperscript{2} Eye Topics (n.d.) The History of Contact Lenses. URL http://www.eyetopics.com/articles/18/1/The-History-of-Contact-Lenses.html

\textsuperscript{3} Eye Topics (n.d.) The History of Contact Lenses. URL http://www.eyetopics.com/articles/18/1/The-History-of-Contact-Lenses.html


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