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Flight Medical

Introduction

Most pilots realize their visual needs in the cockpit are quite different from those required to sit in an office or read the newspaper at home. The distances at which navigational aids and instrumentation are used differ from the customary 40cm reading distance most glasses are prescribed for. Pilots are also exposed to physical and physiological forces that affect visual function in the aircraft. When visiting the optometrist, pilots may fail to explain their unique flying environment adequately to the doctor. It is important to become informed vision care consumers by learning the right questions to ask and the different types of glasses or lenses available.



The Reading Prescription

As people approach age 40, their eyes begin to change. Because of these normal changes, most people over 40 require either reading glasses or bifocals. The reduction in ability to focus on near objects is called presbyopia and represents a normal change associated with aging. Most people use a near working distance of 16 inches. Near working distances for pilots range from 60-90cm in the cockpit, considerably different from the classic 40cm working distance.

It is essential that this difference in working distance is explained to the optometrist, so he/she can lessen the power of the near vision prescription used while flying. Many patients require two pairs of glasses, one for flying and one for more routine uses.

As a pilot, it is important to ensure that the glasses you receive produce the least amount of distortion and require minimal adaptation time. Bifocals that obstruct a person's gaze downward in all directions should be avoided at all costs. The "executive" style bifocal, a bifocal that has a line going across the entire lens, is a poor choice for a pilot, since it is twice as heavy as any other bifocal lens, and it can totally blur distant vision in downward gaze.



The colour of cockpit lighting can also affect your near vision. Red cockpit lighting requires more focusing power to see things clearly up close. White or blue-green lighting is easier to focus in and requires less power. Make sure you tell your optometrist what colour lighting you are functioning in so he/she can duplicate it in the exam room. It is also a good idea to bring an approach plate or other type of publication or sectional with you to the eye exam so you can actually test your new flying prescription before using it in the airplane.

The Distance Prescription

There are three primary reasons people require glasses to see clearly at distances: nearsightedness (myopia), farsightedness (hyperopia), and astigmatism. Nearsightedness is the condition where the eye has too much light bending power built into it. People who are nearsighted see better up close than they do far away. Farsightedness is the condition where the eye has too little light-bending power. This is generally not a problem for those under 40 years old because the eye acts like an autofocus camera and compensates for the condition by adding more power when needed. Hence, distance vision is exceptionally clear throughout the early stages of a farsighted person's life. As farsighted folks approach 40, they will require glasses for reading, and they may have difficulty focusing at distance, especially towards the end of the day. Many pilots fall into this category. Astigmatism is the condition resulting from the imperfect shape of the cornea and/or the lens. Instead of being shaped exactly round, like a baseball, an astigmatic surface is shaped more like an ellipse, or a football. This creates two primary focal planes for the eye. The result is blurred vision. Astigmatism can be associated with nearsightedness or farsightedness, or it can be independent of the two.

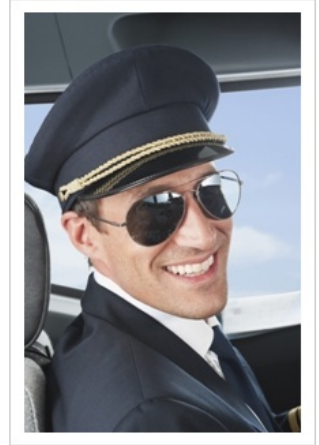


Sunglasses

It is important to protect your eyes from both visible sunlight and potentially dangerous, invisible, ultraviolet light. Wearing either prescription or non-prescription sunglasses will help to maintain your ability to dark adapt for a night flight and make you more comfortable in the cockpit during daytime flying. With thousands of sunglasses on the market, it is easy to pick a style and colour that best suits your needs as a pilot. Sunglasses that block 85% of the light will still enable you to see well on a bright day and view cockpit instruments, yet protect your eyes ability to dark adapt. Sunglasses come in varying colours.

The lens colour with minimal colour distortion is neutral gray. Dark green sunglasses are also very effective. Blue-blocking sunglasses have an amber tint to them. The shortfall of amber lenses is that faint yellow lines can also disappear when viewing through some of these lenses. Remembering that runway obstructions and closed runways are marked with yellow "X's" might make you a little more cautious if you fly with blue blockers. The great advantage of the blue blocker is that by blocking the blues, it eliminates much of the scatter created by the shorter wavelengths of light. The result of this is an apparent increase in contrast on hazy days.

No matter what type of sunglass you purchase, you need to ensure that the glasses block both ultraviolet A (UVA) and ultraviolet B (UVB). UVB (250-310 nm) can possibly cause cataracts, primarily affecting the lens of the eye. UVA (320-400 nm) has been linked to possible changes of the retina and also is associated with common sunburn. It is a good idea have a UV-blocking coating placed on all of your glasses, to ensure that you have continuous protection.



Contact Lenses

It is important that you work closely with your optometrist to select an appropriate contact lens to meet your needs. There are several types of contact lenses available to you. The most common type of contact lens prescribed is the spherical soft contact lens, which generally will give you great vision and good comfort. These lenses are available in disposable, daily wear, and extended wear designs. Soft spherical contacts are also the lens of choice if you are acrobatically inclined, since they are the most stable on the eye. Soft contact lenses that correct for astigmatism, called toric lenses, offer a great alternative to glasses, when appropriately fit. The shortfall of these lenses, is that if they rotate on the eye, vision can blur. Depending on how much astigmatism you have, toric lenses may not afford you the consistently good visual acuity you require as a pilot. The other type of lens available to you is the rigid gas permeable contact lens. Also called "semi-soft" lenses, these lenses give you good clear vision and are sometimes used when a patient has too much astigmatism for correction with soft contact lenses. The disadvantage of rigid gas permeable lenses is that they can be difficult get used to, and in some situations, depending on their size, can slip off the cornea. With any type of contact lens daily wear is recommended. It is healthier to avoid sleeping in lenses (extended wear) unless absolutely necessary.

Conclusion

Going to the optometrist should be a regular, enjoyable event, even if you think your vision is good. In addition to performing the necessary measurements for glasses, an eye examination should also include a comprehensive eye health check. It should include testing for glaucoma, checking for cataracts and other problems associated with the forward portion of the eye, and dilating the pupil, to evaluate the retina and other structures of the eye. Making the optometrist aware of your unique needs as a pilot and being an informed vision care consumer ensures that you continue to receive the appropriate care necessary for good, comfortable, safe vision.