

## **Information on Hyperopia**

### **What is hyperopia (farsightedness)?**

Hyperopia is a condition in which the eye is out of focus. Near vision may be limited. Hence the term "farsighted": one sees far away, but there is a limit on focusing up close.

### **What causes the hyperopic eye to be out of focus?**

The curvature of the cornea, the clear dome covering the front of the eye, may be relatively flat, limiting the focusing power of the eye. Alternatively, the eye may be relatively short from front to back.

### **What does it mean for the eyes to be out of focus?**

To understand hyperopia (farsightedness) and myopia (nearsightedness), one needs to become aware of the eyes' ability to adjust focus automatically.

Try this experiment. Close one eye and hold your thumb six inches in front of your face. Look past your thumb to focus on an object in the distance. Notice that when the distant object is seen clearly, the thumb is out of focus. Now focus on your thumb. When your thumb is seen clearly, the distant object is out of focus. We do not usually realize that our eyes are focused at a given distance because our eyes look around and adjust so quickly. We look out the window, then at the person across the desk, then at our watch -- all seem in focus. We are fooled into thinking our eyes are in focus at all distances at once.

### **How do the eyes adjust focus?**

A circular muscle inside the eye, called the ciliary muscle, attaches around the lens inside the eye. When this muscle contracts, the lens thickens, adjusting the eye's focus.

### **Understanding eyes that are out of focus:**

Imagine looking through a small, hand held telescope with a knob around the eyepiece which is turned to adjust the focus. Numbers around the knob go from 0 to 10. When turned one way the knob stops at 0; when turned the other way the knob stops at 10.

If the telescope is properly focused, it is in focus at far distances when the focusing knob is set on 0, and in focus at closer distances as the knob is turned toward 10. When the focusing knob is turned to 1, the scope is in focus at 1 meter (about 40 inches); when turned to 2, the scope is in focus at 1/2 meter (20 inches); when turned to 4, the scope is in focus at 1/4 meter (10 inches), etc. The closest distance at which the scope can focus clearly on an object is 1/10 meter, or about 4 inches, with the focusing knob turned all the way to 10.

An eye which is neither hyperopic (farsighted), nor myopic (nearsighted), is like the properly focused telescope above. Now imagine a scope which is 2 units out of focus. To see well at far distances the focusing knob must be turned to 2, rather than set on 0. Up close, when the knob is turned all the way to 10, the scope is in focus at 1/8 meter rather than 1/10 meter (5 inches vs. 4 inches). Distance vision is thus good, but requires extra focusing power. Near vision is also good, but the limit of near focus is not quite as close. A hyperopic (farsighted) eye is like the scope in this example.

### **What causes hyperopia?**

The cause is unknown.

### **Is hyperopia always a problem?**

No. It is usually not a problem, because hyperopia is typically mild. Most people, in fact, are slightly hyperopic. If a person can only focus on print as close as 6 inches away, for example, instead of 3 inches away, this is usually not bothersome.

### **What signs might indicate hyperopia?**

Eye strain. Lack of interest in reading. Crossing which is worse up close.

### **When are children given given glasses for hyperopia?**

There are 2 reasons to give glasses to a child with hyperopia: crossed eyes and extreme hyperopia.

### **How do glasses help the hyperopic child whose eyes cross?**

The child with hyperopia has to focus harder to see clearly at a given distance. In some children, this greater focusing effort causes the eyes to cross, especially when looking at near objects. Glasses may reduce or eliminate the crossing by reducing the focusing effort required. In this case glasses are given not to improve vision, but to straighten the eyes.

### **How do glasses help the child who is very hyperopic?**

The child who is extremely hyperopic may not be able to focus clearly on objects any closer than, say, 3 feet away. Because the young child devotes so much attention to objects which can be held and examined closely, this degree of blurry vision up close may interfere with development of the visual part of the brain. In effect, the world appears blurry and the child becomes accustomed to this level of vision. Lack of interest in reading may be seen. Glasses are given in this case to improve vision and make normal visual development possible.

### **Does hyperopia change over the years?**

Yes. A child typically becomes more hyperopic until age 6 or 7, then gradually becomes less hyperopic.

### **Can hyperopia be corrected with contact lenses as well as glasses?**

Yes. Glasses are preferred for young children, but contact lenses are an option for older children, even those whose eyes tend to cross.

### **Is surgery available for hyperopia?**

Laser surgery (PRK, LASIK) for hyperopia in adults is now being done. There is not as much experience with correction of hyperopia as with myopia, though.