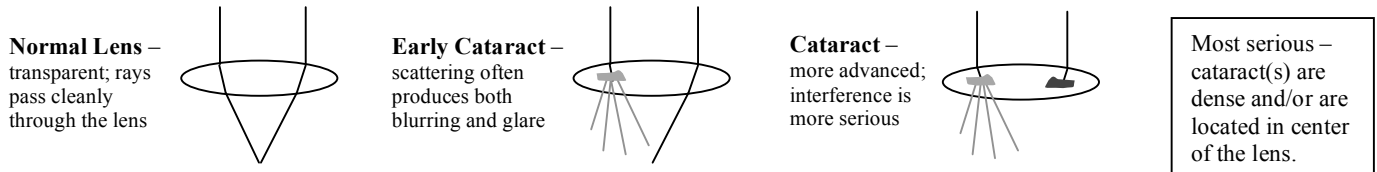


# CATARACTS

Another "challenge" to clarity.....

## The Situation

Besides the problem of presbyopia, as we age the lens in the eye may undergo additional changes that can seriously affect the clarity of our vision. These changes involve **decreases in the transparency** of the lens. Instead of simply transmitting light through itself (and, of course, bending the rays to focus an image on the retina), the lens may become translucent or even opaque. The light may be scattered or blocked. The severity of such changes depends upon exactly where the cataract is located and its optical density. Some examples are shown below:



## The Surgery

At the present time, we have no techniques that will effectively remove just the cataract portion of the lens. If the cataracts reach the point when they affect the daily use of the eye (i.e., the cataract is said to be "ripe"), then the entire lens must be removed. In the past, such removal typically required that a surgeon "grab" the lens (often using a very cold probe that would stick to the lens) and pull it out through a fairly wide incision. Now, the common approach is to use a *very* small incision, destroy the old lens with ultrasound and then vacuum the remains through a small tube. This technique is effective and requires much less time for healing. In fact, the elasticity of the tissues means that the incision closes itself, without the need for even a single stitch!

## The Consequences

Removing the natural lens does have one critical consequence, aside from getting rid of the cataract. The procedure also removes a lot (!) of the focusing power of the eye. If nothing else were done, vision would be far from normal. Thus, various procedures have been used, in order to restore the needed power.

## The Solutions

An early "solution" for replacing the lost power was, quite naturally, the prescription of glasses. Such glasses, however, had to be thick (therefore, heavy). They were very obvious, because they magnified the appearance of the wearer's eyes to others. Worse, they caused distortions, whenever one's gaze moved away from the center.

Later, contact lenses came into use. Because these are close to the wearer's eye(s), they do not lead to the same distortions; weight is also not an important issue. The difficulty is that many older adults – the most likely to experience cataracts and cataract removal – suffer from a combination of other conditions that may interfere with the use of contact lenses. That is, they may have eyes that are drier than those of a 20-year old; this can make wearing contacts uncomfortable. They may also be subject to less-steady and/or less-sensitive hands and fingers; this can make insertion and removal of contacts difficult.

The limitations of glasses and contacts led to the development of INTRAOCULAR IMPLANTS – small plastic lenses that can be inserted directly into the anterior or posterior chamber, to provide the necessary replacement power for the post-removal patient. These implants can be folded into a very compact package, allowing their insertion through the small incision that was used to remove the old lens. Once inside the eye, the artificial lens unfolds and can be prodded into its final placement by the surgeon. The entire procedure itself is typically over in perhaps 15 minutes or less, per eye. (For safety reasons, most surgeons do the procedure on one eye at a time; requiring from a few days to a few weeks between surgeries.)

Following successful lens-replacement surgery, the patient almost immediately experiences potentially dramatic changes in vision. The previous blur and glare are gone; vision is clear again (within the limits of any other eye conditions); colors change. (Most noticeable for me was the sudden awareness that white walls actually looked a lot different than I had been used to; instead of the soft creamy color that I had come to think of as white, they were wonderfully bright and clean in appearance!) Some people describe the sky as appearing much bluer than before, the possible result of no longer looking through the "yellow filter" of the aging natural lens.

Because most implanted lenses cannot change their shape, all accommodation is lost. Although the implanted lenses can provide excellent vision for one distance, the patient will probably need ordinary glasses or contacts as corrective supplements, in order to handle the full range of visual situations. For example, if the implants provide the appropriate focus for far distances, the patient may need to wear an additional correction when reading. Current research is, however, making rapid progress on implantable lenses that can provide focus for multiple distances. Several of these are already available, although they are not yet without some problems.