



If you have cataracts, you are considering surgery because your cataracts prevent you from seeing well even with corrective eyeglasses. After cataract surgery, you should be able to see well at far, mid-range, and near distances with new eyeglasses (assuming no other eye health problems). The decision about which type of artificial lens implant to have will affect your ability to see *without eyeglasses* following cataract surgery. There are 3 categories of artificial lenses for cataract patients to choose from: **single focus** (monofocal), **extended focus** (greater range than a monofocal, but not as much as the multifocal), and **multifocal** (a progressive trifocal, with many continuous focal points).

Our eye is like a camera and must continually shift its focus from far to near and to various distances in-between. There are four primary zones or distances at which we need to be able to see details.

Zone 1: Far distance (street signs, golf ball, distant animals, theater stage)

Zone 2: Indoor distances (pictures on the kitchen wall, faces across the table, TV 8 feet away)

Zone 3: Arm's length (dashboard, store shelves, stove, desktop computer, piano, bathroom mirror)

Zone 4: Reading distance (magazine, cell phone, tablet device, medicine bottle label)

Young people have the best system, a flexible human lens that is constantly and automatically adjusting its shape to change focus. This is like having an “auto-focus” camera where you just point the camera (or eye) at something and the focus is automatically and instantly adjusted. With age, we all lose this convenience and end up with a “manual” focus camera—we must manually change the focus by switching between different pairs of eyeglasses for each distance that we need to see. Bifocals and trifocals are like having 2-3 different pairs of glasses combined into one frame. Progressive (“no line trifocal”) eyeglasses allow us to see all four zones by looking through different parts of our eyeglasses as though we had 4 different pairs of glasses stacked one above the other.

With the basic **single focus** (monofocal) artificial lens implant, you select which of the 4 zones you'd want to see optimally without any eyeglasses on. You then have the same eyeglass options as everyone else over the age of 50 to allow you to “manually” change your focus (i.e., moving the focus farther away or closer up). This could mean separate distance, reading, and computer glasses, bifocals, trifocals, or progressive trifocals. You can also continue to wear contact lenses.

**Extended focus** lens implants provide greater focusing range due to increased “depth-of-focus”. Compared to the basic monofocal lens implant set for distance (zone 1), patients with the **extended focus** lens have noticeably better mid-range vision at arm's length (zone 3) but still require reading glasses (zone 4). The PanOptix **trifocal** lens implant is the newest multifocal lens implant and can provide continuous focus across all 4 zones. This occurs naturally and automatically without having to look through different parts of the artificial lens, so the mechanism is completely different than with wearing trifocal eyeglasses. These patients wear glasses the least often but must have a healthy cornea and retina. The *PanOptix* multifocal lens produces rings around lights at night; the *Vivity* extended focus lens does not.

**Astigmatism** is a natural blur or misfocus caused by an imperfect shape of the cornea at the front of the eye. Like nearsightedness, astigmatism isn't a disease, but rather a natural misfocus that requires corrective eyeglasses for the clearest vision. Instead of placing the astigmatism correction into one's spectacles, it can be incorporated into the artificial lens implant instead. The name of this built-in feature is “toric,” and it can be incorporated into any of the 3 lens implant types (monofocal, extended focus, or multifocal). Finally, an **adjustable** lens implant may be particularly advantageous for patients who previously had LASIK or refractive surgery.