

"Doctor, my arms are too short"

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Summary: Reducing near vision occurring sometime after age 40 affects everyone. It is not a problem of "shrinking arm length" as people find themselves pushing things further and further away to see. It is a normal effect of maturing eyes and one which everyone should understand so they can recognize its signs and consider their numerous options for correction.

All of us hope for a happy and healthy aging process. We want to enjoy our families, our friends, our faith and certainly, good health. Preserving our eyes and vision are a very big part of those hopes. And understanding our aging eyes can help make a large portion of our hopes a reality and an enduring enjoyment through the "golden decades" of life. Creating that understanding of our aging eyes and vision is the goal of this column.

Our eyes are among the most delicate and complex organs of our body. Besides their fragile tissues and nerve structures, in conjunction with the brain, they also provide the highly complex function of sight. This precious sense is affected by the aging process as the delicate tissues of the eye that produce our sight begin to show the effects of aging.

One particular tissue change produced during aging affects the vision of all people sometime after 40 years, sometimes a little sooner and sometimes as late as 50ish. But the changes "always" occur and in "everybody!" Thus, it's worth beginning our journey of understanding the aging eye by starting with this most universal condition called "presbyopia"

The eye structure involved in presbyopia is called "the crystalline lens" or just "the lens." This lens is found inside the eye, just behind the iris (the colored portion) and pupil (the opening in the center of the iris that lets light into the eye) -see diagram. Focusing of light coming into the eye onto the retina (at the back of the eye) is the lens' principle function.

The good news and bad news about the lens has to do with the capsule that protects it. The good news is that the delicate contents of the lens (the cortex and nucleus) critical for focusing power are well protected throughout life by this capsule which doesn't let anything into the lens to disturb its clarity and focusing function. The bad news is the capsule doesn't let anything out either! Thus, throughout life, the lens retains all of its old cells and byproducts. Beyond about age forty, this unique characteristic of the lens leads to two effects in our vision. One is a gradual clouding of the lens called "cataracts" which we will discuss in detail in upcoming columns; and the other is a gradual hardening of the lens with a resulting reduction of the lens' flexibility which it uses to produce magnification power for focusing on things as they move closer to us, like reading material.

The loss of lens flexibility which again, happens in "everybody" as we and our lens age is what causes presbyopia. This produces our gradual inability to focus on close up objects or printed materials.

So what do we do? We keep trying to reduce that need for lens magnification by moving things further back. But this solution leads to one big problem. "Our arms get too short!"

It's kind of interesting how people notice this process of presbyopia occurring. Some recognize it early and can almost count the inches of "extra arm length" they need every few months after first noticing the phenomenon. Some recognize it at first only at certain times of day and in certain lighting conditions (usually more in the later day and in poor lighting). But some don't recognize it at all for years, even though the process, for sure, has begun. This latter group, however, often experiences the "sudden" effect we see so often in patients who come in emergently telling us, "I went to bed last night and I could

see OK, but I woke up this morning and I can't read anything!" We're not sure why it happens this way in some people (maybe it's like an ever tightening spring that finally releases and there's no getting it recoiled again), but it certainly causes alarm and the need for reassurance, understanding and corrective lenses.

The lenses used to correct presbyopia are simply a substitution for the magnification power our natural lens (inside our eye) had been giving us, until it lost its flexibility. If the person has no other problems for distance vision like nearsightedness (myopia), astigmatism or farsightedness (hyperopia), the magnification power for near vision is supplied through a simple pair of single vision, reading glasses. If the person, however, has the need for a corrective prescription at distance, then the near prescription must be added in the form of bifocal lenses (one power for distance and one power for near) or even trifocals or "progressive addition" lenses that provide increasing magnification power for progressively closer focusing lengths.

The use of reading glasses, bifocals, trifocals, etc. is the longstanding, traditional means of assisting presbyopic patients. Many of these folks are quite happy with these methods of correction, but some never adapt or enjoy the experience. New technologies and procedures are revolutionizing ways and means of reducing and even eliminating the problems of presbyopia (and "arms that are too short"). Each has strengths and weaknesses and all are worth understanding to consider which might be best for you. Future columns will deal with each of the new developments in presbyopic care.