

PROGRESSIVE MULTIFOCAL CONTACT LENSES

My name is Mario Giovanzana, I have a degree in Optics and Optometry and I have been working in the manufacture and fitting of contact lenses for over 27 years.

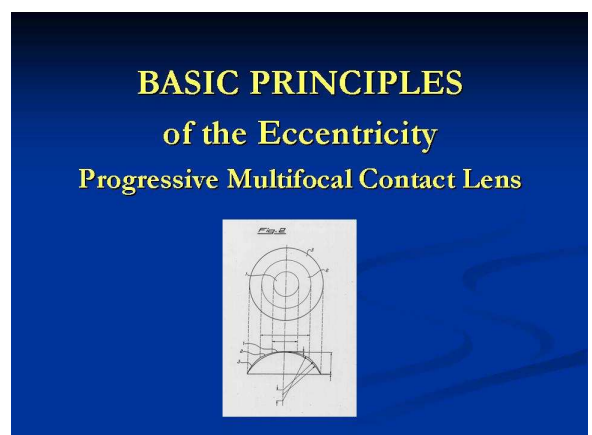
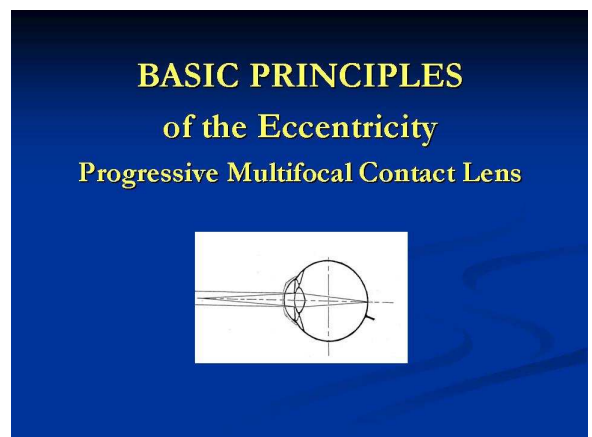
I my professional experience over the years, I have developed both support in the production of contact lenses as well as their design and planning, which is my personal interest.

For a long time, then, I have been studying the geometry of the lenses I produce with the help of computerized systems that allow me to guarantee their reproduction in time.

In the midst of this professional activity and starting from the “know-how” I had acquired in the geometry of aspheric lenses, I have been able to realize a project that has led me to the realization of multifocal lenses, which I have patented in Italy and in other countries and which I will present to you in the most essential parts.

By using a single dioptric medium, the eccentricity progressive, multifocal contact lens insures the correction of visual defects with regard to both long-distance vision (myopia or hypermetropia) as well as short distance vision (presbyopia).

This contact lens is based on the principle that the central area of the external surface is spherical and designed in such a way as to permit perfect long-distance vision in any lighting conditions, in addition to optimal short-distance vision, by taking advantage of the concentric area which has an aspherical and eccentricity progressive curve.



Only by using an eccentricity progressive curve can the variations in the power of the lens be obtained in such a limited space; and the greater the difference between the correction for long-and-short-distance vision, the more accentuated the progression should be.

With my system, negative or positive contact lenses can be constructed of any material, hard or soft and with positive or negative addition, since it is the external surface of the lens which functions optically while the shape of the internal surface is designed in relation to the shape of the cornea. This aspect is fundamental in the science of contact lenses in that the movement of the lens in the eye determines the very stability of the lens itself and thus any image fluctuation for long-or short-distance vision.
For this reason, I have aimed at working on the external surface of the lens to guarantee optimal application.

THE ABERRATION GRAPHICS

- SPHERICAL LENS
- ASPHERICAL LENS
- BIFOCAL LENS
- PROGRESSIVE MULTIFOCAL LENS

PRINCIPLES OF FITTING

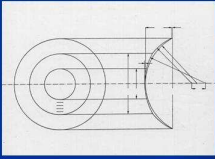
In my experience of fitting multifocal contact lenses, I have determined that the most frequent values of addition to be used are schematically:

LOW VALUE ADDITION +0.75

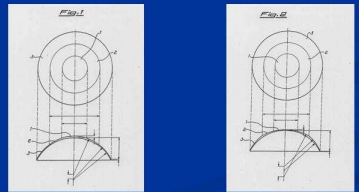
This value of addition is applied in case of:

- 1) High myopics power
- 2) Myopia in young people
- 3) Slight presbyopia

BASIC PRINCIPLES of the Eccentricity Progressive Multifocal Contact Lens

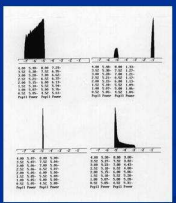


BASIC PRINCIPLES of the Eccentricity Progressive Multifocal Contact Lens



THE ABERRATION GRAPHICS

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LOW VALUE ADDITION +0.75

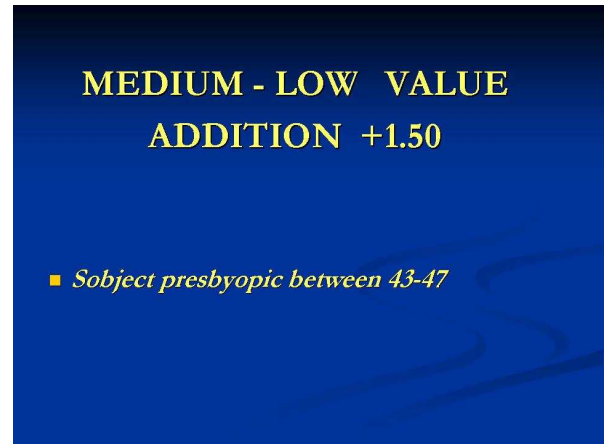
- High myopics power
- Myopia in young people
- Slight presbyopia
- Hypermetropia

4) Hypermetropia

This type of intervention, in particular, represents an advance solution to the correction of progressive myopia in young subjects. A low value addition of between +0.75 and +1.25, in fact, lets the ametropes reduce the accommodating stress induced by the aberration generated by the spherical shape of the lens.

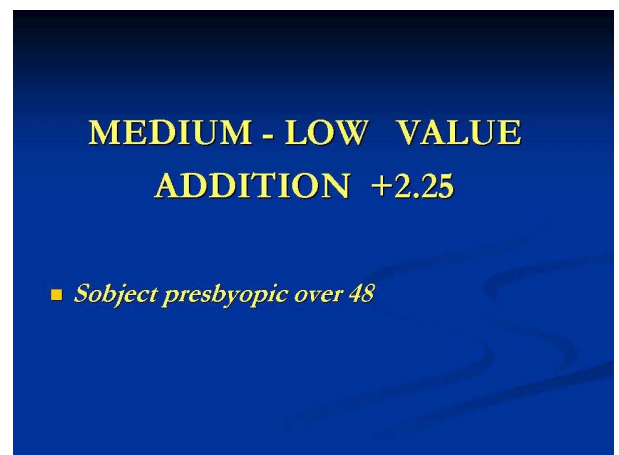
MEDIUM-LOW VALUE ADDITION +1.50

This value of addition is usually applied in cases of presbyopia in subjects between the ages of 43 and 47.



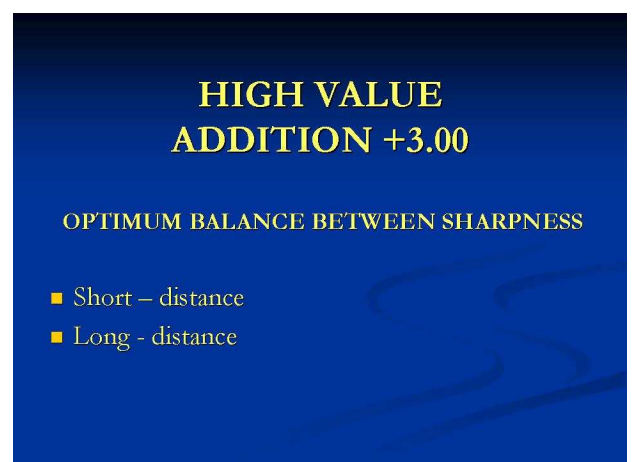
MEDIUM-HIGH VALUE ADDITION +2.25

This value of addition is usually applied in cases of presbyopia in subjects over the age of 48.



HIGH VALUE ADDITION Test Lens +3.00

Such a value of addition is utilized almost exclusively as a test for the proper correction of long-distance vision. In cases which require high value addition, it is of great use in the individualization of the optimum balance between sharpness in long-distance and short-distance vision.



PROCEDURES

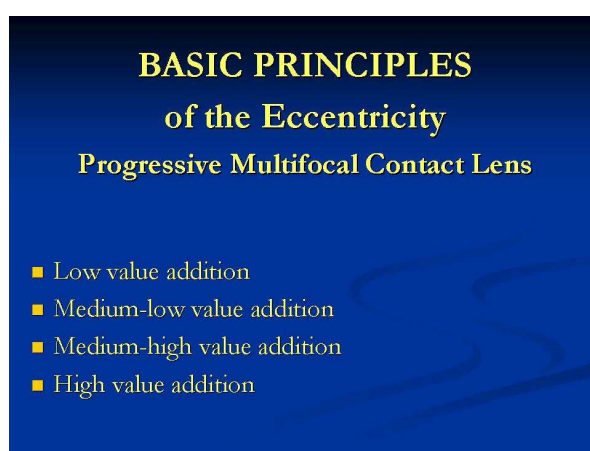
1. Examine the patient with the customary correction and take note of monocular and binocular vision.
2. Proceed with the subjective examination, do the refraction and using the minimum negative power, correct binocular vision, until the best possible sight has been obtained.
3. Once long-distance binocular vision has been established, proceed to the correction of short-distance vision, adjusting the trial frame with the minimum addition for reading at the desired distance. Take note of the power of the setting.
4. Select the first trial lens according to this table:

Low value addition

Medium-low value addition

Medium-high value addition

High value addition



The correction of short-distance vision should be compatible with maintaining the visual acuity of long-distance vision, which should be verified in relation to the spherical power individualized in the first part of the test.

If long-distance vision should get worse and if, in order to obtain optimal visual acuity, a negative spherical value must be added, the previous lens should be restored by adding the algebraic total of the test lens with the additional lens. It is important, however, not to surpass the value of the ideal lens for long-distance correction.

5. Test short-distance vision using various intensities of light, proceeding from larger characters to smaller ones, covering the latter in order to give the patient time to gradually get used to the new kind of vision.
6. The total of the corrective values (spherical power and positive addition), which represent the best compromise in guaranteeing the solution of the patient's visual problems, will constitute the starting point for ordering the first set of lenses.

EXAMPLE

Patient: 50 years old Px -8.00 VA 10/10

- Anamnesi
- Biomicroscopia with lamp
- Opthalmometria
- Keratometria
- Take note of the visual acuity, both long-distance and short-distance, with the customary correction
- Subjective exam for long distance vision
- Subjective exam for close vision
- Ideal monofocal contact lens power for long distance: -7.25
- Select the first lens set with the power -3.00
- Reduce the power (0.25 – 0.50) of the addition for long-distance vision with relation to the apical distance

1st: -3.00 over Px -4.50 10/10= -7.25

2nd: -3.00 over Px -4.50 10/10= -7.25

3rd: -3.00 over Px -4.50 8/10= -7.25

Increase the power by -0.50 to restore visual acuity for long-distance vision

Px -5.00 10/10=-7.75

This application is not correct in that the algebraic total is more than the ideal monofocal power for long distance by D -0.50

4th: -3.00 over Px -5.00 8/10= -7.75

Increase the power by -0.50 to restore visual acuity for long-distance vision

Px -5.50 10/10= -8.25

This application is not correct in that the algebraic total is more than the ideal monofocal power by D-1.00

- Subjective exam for long distance
- Subjective exam for close vision
- If everything is OK, order the lenses!

EXAMPLE

Patient: 50 year old Px -8.00 VA 10/10

- Anamnesi
- Biomicroscopia
- Optalmometria
- Visual acuity
- Ideal monofocal contact lenses
- Subjective exam from long and close vision
- If everything is OK order the lenses