

Defocus curves standardized criteria on visual performance of a small-aperture IOL: First comparison of results after contralateral and bilateral implantation1
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3 We have read with high interest the original article from Ang,¹ who evaluated the visual
4 properties of bilateral implantation of the small-aperture intraocular lens (IOL) (IC-8
5 IOL; Acufocus, Irvine CA) in comparison to contralateral implantation using defocus
6 curves and contrast sensitivity test and who found that contralateral and bilateral
7 implantation of an IC-8 IOL provide excellent visual acuity across all tests.

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7 We do not want to criticize its results as we find them very interesting and novel but
8 rather, we would like to highlight the defocus curves methods description. Author
9 referred: " The technician first defocused the image by placing a +5.00-D lens in front
10 of the eye, and then progressively changed the defocus lens in 0.50-D increments
11 from +5.00 to -5.00 D" using ETDRS lightbox at 4 m. What is not reported is whether
12 there was randomize either the lens presentation order or in the letter sequences on
13 the test chart to prevent learning effects.

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15 Gupta et al.² found that it was necessary to randomize either the lens presentation
16 order or the letter sequences on the test chart to prevent learning effects. In their
17 research showed how overestimated depth of focus of the Array multifocal IOL by
18 using negative to positive lens progression with non-randomized letter sequences to
19 measure their defocus curve. Later Buckhurst et al.³ settled area-of-focus
20 measurements when defocus curves because of conventional depth-of-focus metrics

21 (which relative or absolute criteria) provide a single value to quantify the range
22 useful of vision. The conclusion of his study was that defocus curve method and
23 analysis need to be standardized so that results can be compared between studies.³

24 Although these authors³ have established the need to seek a common and
25 standardize criterion in defocus curves in order to compare different IOL, nowadays
26 we still do not have standardized criteria. If we see other studies such as Cochener et
27 al.⁴ where in their remarkable research using defocus curves compared AcrySof IQ
28 PanOptix; (Alcon Laboratories, Inc., Fort Worth, TX), FineVision Micro F (PhysIOL SA,
29 Lisse, Belgium) or TECNIS symphony (Medical Optics, Inc., Abbott Park, IL). However,
30 despite being a very well-designed study, if we look at its methods, we do not find how
31 they performed the defocus curves. Something similar happens with another
32 interesting paper of Steinwender et al.⁵ who found that implantation of a monofocal
33 spherical IOL resulted in an increased depth of focus without significant degradation
34 of distance visual acuity or contrast sensitivity with no differences in the depth of focus
35 between hyperopic eyes and emmetropic eyes. In this study, authors stated in
36 methods that defocus curves were assessed by patients read ETDRS logMAR visual
37 acuity charts at four meters under photopic conditions induced with trial lenses
38 (between -1.5 and 1.5 D in steps of 0.5 D). As we checked these steps when
39 performing the blur differs from that of other research and randomization was not
40 reported. Therefore, although the need to standardize defocus curves has long been
41 established by Gupta et al.² studies or Buckhurst et al.³ and although it seems that the
42 most recent studies are being standardized. In our opinion, defocus curve
43 standardized criterion methodology description has not yet been definitively achieved
44 and we continue to see studies with their own criteria. We highly recommend to the
45 scientific community that it would be very important to try to reach a standardization
46 when measuring the defocus curves, perhaps using some device that could make the
47 curves standard and fast, so that we could better understand and compare the
48 published studies.

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