



Contrast sensitivity and vision at all distances: Intraocular lenses from ZEISS obtained excellent results in studies

At the summer meeting of the European Society of Cataract and Refractive Surgeons (ESCRS) in Barcelona, scientific studies will be presented in which patient satisfaction with ZEISS trifocal intraocular lenses (IOL) was superior to that of comparable competitor products. With the monofocal hydrophobic IOL CT LUCIA®, the AT LISA® tri family of multifocal IOL and ZEISS Cataract Suite *markerless*, ZEISS offers a comprehensive product portfolio with a broad spectrum of solutions characterized by exceptionally good optical quality and sophisticated solutions for the clinical workflow in cataract treatment.

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New study results presented for the first time at the ESCRS demonstrate that the premium intraocular lenses (IOL) of the **AT LISA® tri** product family are particularly convincing in key criteria in clinical practice. The positive results tendered at the ESCRS by Professor Jorge Alió of the Miguel Hernández University in Alicante, Spain, corroborate the clinical data already obtained by him.

“Results that are hard to beat” in vision at all distances

According to a study by Professor Jorge Alió et al. published in the Journal of Cataract and Refractive Surgery¹ in 2014, patients in which trifocal IOL AT LISA® tri had been implanted in both eyes were highly satisfied with their vision in different conditions and at varying distances, as shown by the so-called defocus curve: Six months after IOL implantation all of the 30 patients which had had implanted a trifocal lens from ZEISS were satisfied with the visual acuity at far, intermediate, and near distances. The scientists in Professor Alió’s group described in the study that at all three distances the IOLs of the AT LISA tri product family provided the participating patients with excellent or very good vision and no correction by vision aid needed.^{1a} “The AT LISA tri [...] has shown unbeatable results in improving near, intermediate and distance visual acuity in presbyopic patients,” Professor Alió sums up in an article in his recently published



book “Multifocal Intraocular Lenses. The Art and the Practice” (Springer, 2014), which compares different IOLs³.

Extremely positive surprise with contrast sensitivity

In addition to the defocus curve, contrast sensitivity is in his words a further criterion for the efficiency of an implanted IOL. As a rule, the best contrast sensitivity is to be anticipated in patients with an implanted monofocal IOL, because here the light is bundled and not scattered over several focal points as with a trifocal lens. However, the trifocal lenses from ZEISS, according to the study¹, produced excellent results with respect to contrast sensitivity. In his words it is interesting to note that with regard to contrast sensitivity the results obtained with ZEISS trifocal lenses in the study were so close to those with monofocal lenses. “The toric version of the AT LISA tri, implanted in patients with astigmatism, achieved the best value in our study within the top level group with all other multifocal IOLs,” says Professor Alió. He concluded that the study showed that the functions of trifocal lenses extended to include dedicated focal points can be achieved for the participating patients with practically non-visible compromises in contrast sensitivity. “I was extremely surprised by this result”, says Professor Alió. The hitherto unpublished results of the clinical data collection² of Professor Alió confirm the special quality of IOLs from ZEISS with regard to contrast sensitivity and vision at all distances.

Extremely good results in patient satisfaction

According to Professor Alió, general patient satisfaction with vision at all distances was positively assessed by the participants. “All patients rated the result as excellent or very good,” says Professor Alió. Furthermore, without exception, all patients would recommend this type of IOL.^{3a}

While the result from Professor Alió's study was hitherto unique with regard to contrast sensitivity, further studies on the defocus curve and patient satisfaction have produced similar results. An example is the study by Elizabeth M. Law et al which was published in the European Journal of Ophthalmology in 2013⁴. She arrives at the conclusion that AT LISA tri, the trifocal IOL from ZEISS, provides excellent uncorrected distance, intermediate, and near visual outcomes. Nearly all [of the 30 patients participating in the study] were satisfied with their vision at all distances^{4a}, as E. Law et al. sum up their results. Only 2 patients required the occasional use of spectacles after surgery.



Broad selection for cataract surgeons and leadership in trifocal IOLs

“For us, patient satisfaction is the top priority. In IOL development, ZEISS could contribute special capacities in optical design”, says Dr Ludwin Monz, Chief Executive of Carl Zeiss Meditec AG. “We are pleased with the excellent results of the studies. They demonstrate that we live up to our goals for the quality of clinical results.” In addition to trifocal IOLs, monofocal IOLs and IOLs in both hydrophilic and hydrophobic materials are still available to ZEISS customers – making it a very broad portfolio of IOLs. The well-established range of hydrophilic MICS IOLs with a high dioptric range has been rounded off by the **CT LUCIA** monofocal hydrophobic IOL since 2014.

The IOLMaster® 700 which was introduced in 2014 brings both physician and patient added safety thanks to its image-based measurement. It is an integral part of the ZEISS Cataract Suite *markerless* to assist surgeons in maintaining a smooth workflow before, during and after the implantation of high-quality intraocular lenses.

Study details:

¹ Mojzis, P., Alió J.L. et al: Outcomes of a new diffractive trifocal intraocular lens; published in: *Cataract & Refractive Surgery Today* 2014;40:60-69.

^{1a} Mojzis, P., Alió J.L. et al: Outcomes of a new diffractive trifocal intraocular lens; published in: *Cataract & Refractive Surgery Today* 2014;40:p. 68.

² Alió, J.L. et al: Visual outcomes of a new toric trifocal diffractive intraocular lens. Accepted for publication in: *Journal of Cataract and Refractive Surgery* 2015.

³ Alió, J.L. & J. Pikkell: Multifocal Intraocular Lenses. The Art and the Practice. Published in: Singh, A D. (Editor): *Essentials in Ophthalmology*. Springer 2014.

^{3a} Alió, J.L. & J. Pikkell: Multifocal Intraocular Lenses. The Art and the Practice. In: Singh, Arun D. (Editor): *Essentials in Ophthalmology*. Springer 2014. p. 207.

⁴ Law, E. M., Aggarwal, R.K. & H. Kasaby: Clinical outcomes with a new trifocal intraocular lens. In: *European Journal of Ophthalmology* 2013.

^{4a} Law, E. M., Aggarwal, R. K. & H. Kasaby: Clinical outcomes with a new trifocal intraocular lens. In: *European Journal of Ophthalmology* 2013, p. 5.

⁵ Mojzis, P. et al: Comparative analysis of the visual performance after cataract surgery with implantation of a bifocal or trifocal diffractive IOL. In: *Journal of Refractive Surgery* 2014, 30, 10.



^{5a} Mojzis, P. et al: Comparative analysis of the visual performance after cataract surgery with implantation of a bifocal or trifocal diffractive IOL. In: Journal of Refractive Surgery 2014, 30, 10, p. 3.

⁶ Mojzis, P.: High Patient satisfaction with the AT LISA tri 839MP. After implantation, patients achieve quality vision at all distances. Insert to Cataract & Refractive Surgery Today Europe 2012.



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Brief profile

Carl Zeiss Meditec AG (ISIN: DE 0005313704), which is listed on TecDAX of the German stock exchange, is one of the world's leading medical technology companies. The company supplies innovative technologies and application-oriented solutions designed to help doctors improve the quality of life of their patients. It provides complete packages of solutions for the diagnosis and treatment of eye diseases - including implants and consumable materials. The company supplies innovative visualisation solutions in the field of microsurgery. Carl Zeiss Meditec AG's medical technology portfolio is rounded off by promising future technologies such as intra-operative radiotherapy. In financial year 2013/2014 (ended 30 September) the Group's almost 3,000 employees generated revenue of almost € 909 million.

The company is headquartered in Jena (Germany), and in addition to subsidiaries in Germany and abroad more than 50 percent of its employees are based in the USA, Japan, Spain and France. The Center for Application and Research India (CARIn) in Bangalore and the Carl Zeiss Innovations Center for Research and Development in Shanghai, China, strengthen our presence in these rapidly developing economies. Around 35 percent of Carl Zeiss Meditec AG shares are in free float. The remaining 65 percent are held by Carl Zeiss AG, one of the world's leading companies in the optical and opto-electronics industry.

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