

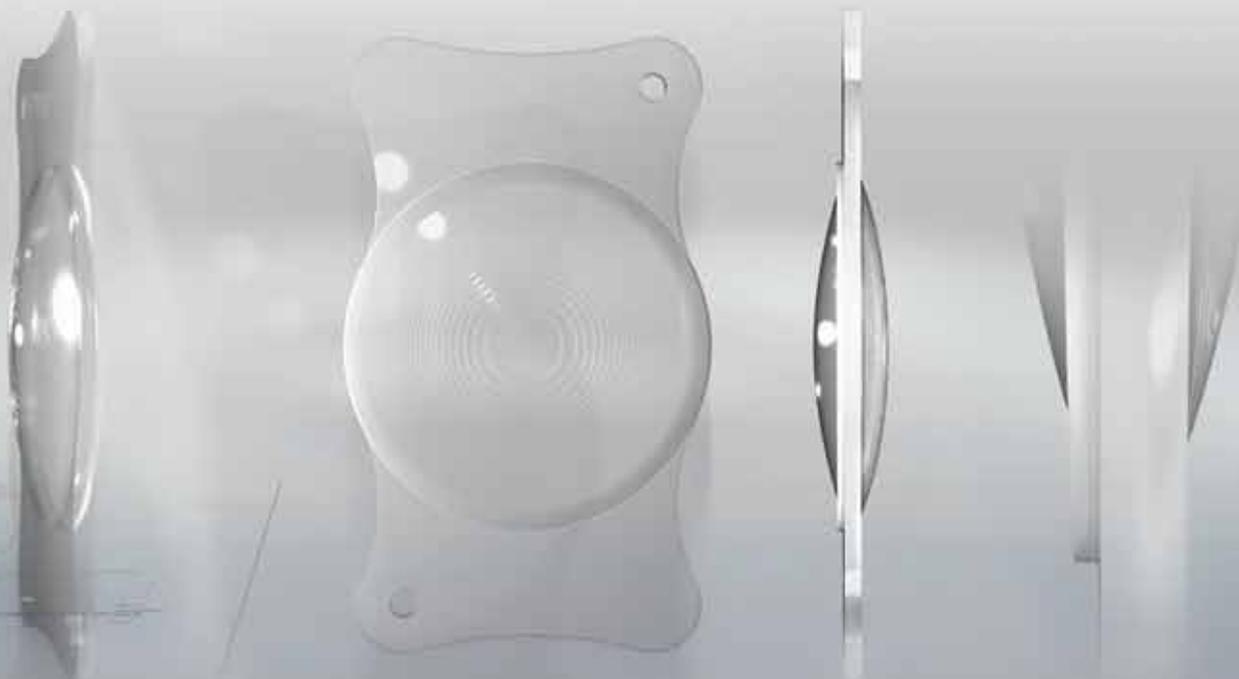
# Cataract & Refractive Surgery

**EUROPE**

**TODAY**

# AT LISA tri 839MP

The first trifocal preloaded true-MICS IOL  
for real intermediate vision.



# AT LISA tri 839MP

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# The AT LISA tri 839MP

The first trifocal preloaded true MICS IOL for real intermediate vision.

The high-performance aspheric multifocal IOL platform of the AT LISA (Carl Zeiss Meditec) is designed for sub-2-mm microincision cataract surgery (MICS). LISA is an acronym for the IOL's four unique principles: Light distributed asymmetrically, Independency from pupil size, SMP technology for ideal optical imaging quality with reduced light scat-

tering, and Aberration-correcting optimized aspheric optic for better contrast sensitivity, depth of field, and sharper vision.

The original lens was designed with an asymmetrical light distribution of 65% for distance focus and 35% for near focus. This design improved intermediate vision and greatly reduced halos and glare compared

## AT LISA TRI 839MP: TECHNICAL DATA

Technical data	AT LISA tri 839MP preloaded
Optic Design	Trifocal, diffractive, +3.33 D near add and +1.66 D intermediate add at the IOL plane, aspheric (aberration correcting)
Material	Hydrophilic acrylic (25%) with hydrophobic surface
Optic Diameter	6.0 mm
Total Diameter	11.0 mm
Haptic Angulation	0°
Lens Design	Single-piece, MICS
Incision Size	1.8 mm
Company Labeled A-Constant <sup>1</sup>	118.6
Diopter Range	From 0.0 to +32.0 D 0.0 to +32.0 D, 0.5 D increments
Anterior Chamber Depth	5.32
Implantation	In the Bag
Injector / Cartridge Set <sup>2</sup>	BLUEMIXS 180
Indications	Presbyopia correction in patients with or without cataract (Prelex or clear lens exchange)

<sup>1</sup>Please refer to the Carl Zeiss Meditec web pages for optimized A-Constants.

<sup>2</sup>Please refer to the Carl Zeiss Meditec web pages for the most up-to-date references.



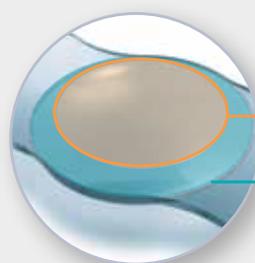
AT LISA tri anterior view



AT LISA tri posterior view



AT LISA tri profile



Trifocal optic over 4.34 mm

Bifocal from 4.34 to 6.00 mm

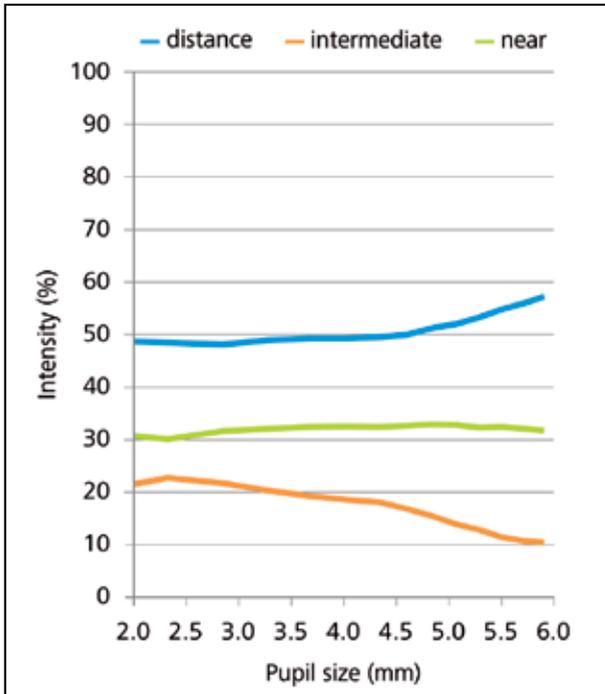


Figure 1. Light distribution of the AT LISA tri.

with other multifocal IOLs. But the latest AT LISA lens design, the AT LISA tri 839MP (Table 1), goes one step further with its unique asymmetrical light distribution of 50%, 20%, and 30% for far, intermediate, and near foci, respectively. This breakdown of light distribution at each distance is designed to provide more satisfying and predictable visual outcomes for younger patients with active pupils at all distances (Figure 1). Visit [eyetube.net/?v=fepoo](http://eyetube.net/?v=fepoo) to watch a video about the AT LISA tri.

**LENS DESIGN**

Other advantages of the AT LISA tri are detailed below.

**Improved intermediate vision.** The optical zone of the AT LISA tri has a 3.33 D near addition and a 1.66 D intermediate addition, providing patients with significantly improved intermediate vision without compromising near or far vision. Additionally, the refractive-diffractive profile of the AT LISA tri is also designed



Figure 2. The AT LISA tri has fewer concentric rings on its optic.

to enhance intermediate vision over the central optic, increasing light transmittance to approximately 85.7% (data on file with Carl Zeiss Meditec).

**Fewer visual disturbances.** With fewer rings on the optical surface (Figure 2), the AT LISA tri reduces the risk for visual disturbances and has the potential to improve night vision compared with other multifocal IOLs. There are also no sharp angles on the optical surface, thus providing patients with ideal optical image quality, contrast sensitivity, and reduced light scattering.

**High resolution in all lighting conditions.** The images produced with the AT LISA tri are in high resolution at every distance (near, intermediate, and far), and in all lighting conditions. Patients can easily switch between foci at varying distances without the need for spectacle correction (Figure 3).

**Maximum pupil independence.** The AT LISA tri is independent of pupil diameter up to 4.5 mm. Its aberration-correcting aspheric optical design provides patients with sharp functional vision in all lighting conditions and across all distances. Air Force Resolution

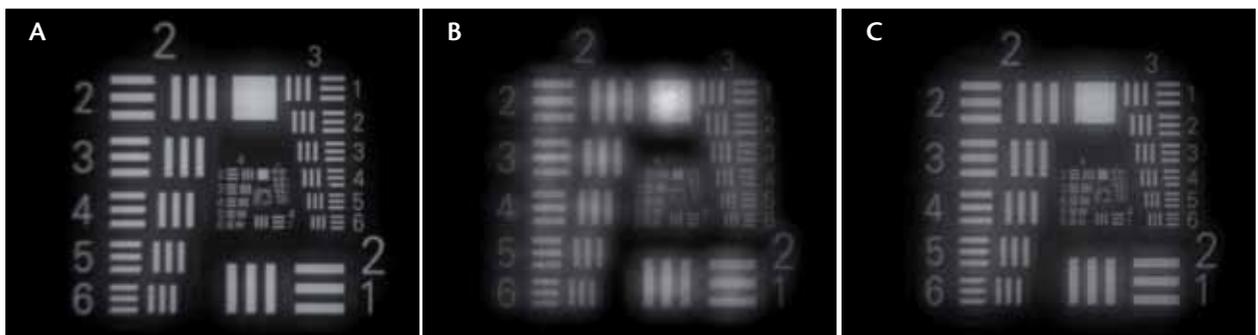
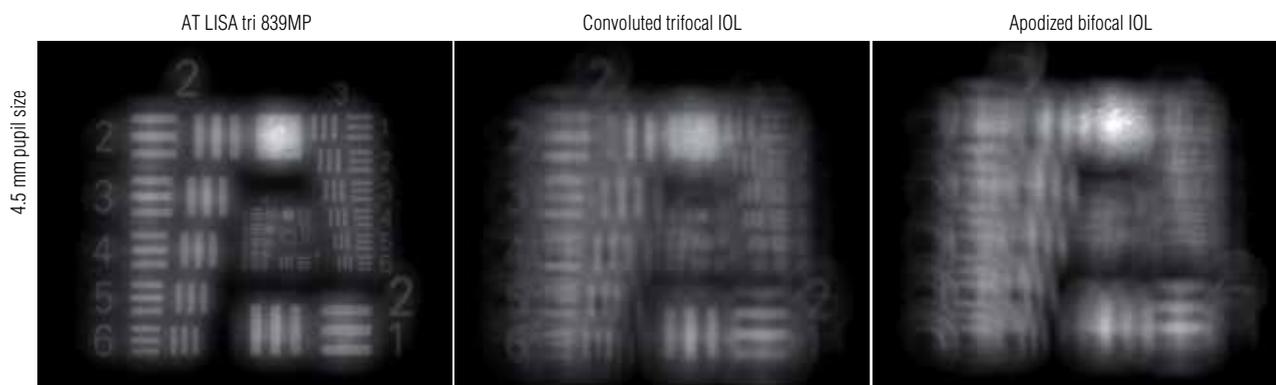


Figure 3. AT LISA tri at (A) far, (B) intermediate, and (C) near vision targets in normal light conditions.



**Figure 4. United States Air Force Resolution Target Test (AFT) for AT LISA tri 839MP and other bi- or trifocal IOLs at intermediate distance in low light conditions.**

Target Test (AFT) for AT LISA tri 839MP and other bi- or trifocal IOLs at intermediate distance has shown that the AT LISA tri offers far better intermediate vision even in low light conditions (data on file with Carl Zeiss Meditec; Figure 4).

#### **CONCLUSION**

The latest AT LISA design, the AT LISA tri 839MP, has a unique asymmetrical light distribution design

to produce more satisfying and predictable visual outcomes to younger patients. A number of surgeons already have experience implanting this lens in their patients, and patients have expressed their satisfaction with the quality of vision the AT LISA tri provides them.

The following articles, written by some of the first surgeons to implant the AT LISA tri in patients, are testament to the improvements of this lens design. ■

# Introducing a New Generation of the AT LISA

The trifocal design provides excellent intermediate vision without sacrificing far and near.

BY DOMINIQUE PIETRINI, MD

Today, the majority of patients presenting for cataract surgery or clear lens extraction are harder to please than those treated in previous decades. Our patients now expect high-quality care, they want perfect or near-perfect vision that rivals the vision they enjoyed in their youth, and they will settle for nothing less than exceptional surgical outcomes.

Luckily, modern IOLs produce outstanding visual quality and state-of-the-art surgical devices can be used to enhance outcomes even further. One of the most promising new modern IOL designs is the AT LISA tri 839MP (Carl Zeiss Meditec). This third-generation lens design is based on the well-known, high-performance AT LISA platform and, in my personal experience, provides patients with excellent functional vision at all distances as early as the day after surgery. More specifically, the AT LISA tri enhances intermediate vision compared with its bifocal predecessor. In my opinion, it is this one-piece, trifocal lens design that gives patients the best chance of leading a spectacle-free, active lifestyle.

I started implanting the AT LISA tri in July 2011, but I also have extensive experience with the bifocal AT LISA. In a study including more than 100 eyes, the mean intermediate visual acuity with the AT LISA bifocal was 20/32, the mean near UCVA was J2, and the mean far UCVA was 20/20. Patients were satisfied with their vision after surgery; however, some complained that intermediate vision was not as crisp as they would have liked.

Now, as one of the main users of the new AT LISA tri, I have noticed that these complaints have disappeared. In the 10 patients included in my initial analysis, mean intermediate visual acuity was 20/25, and the near and far UCVA were comparable to those achieved with the AT LISA bifocal, at 20/20 and J2, respectively. Figure 1 depicts the similarities in defocus curve of the AT LISA tri versus a bifocal lens designs for near and far UCVA. The defocus curve also shows that the AT LISA tri provides a significant improvement in intermediate vision (Figure 2).

With four haptics, the AT LISA tri is very stable in the

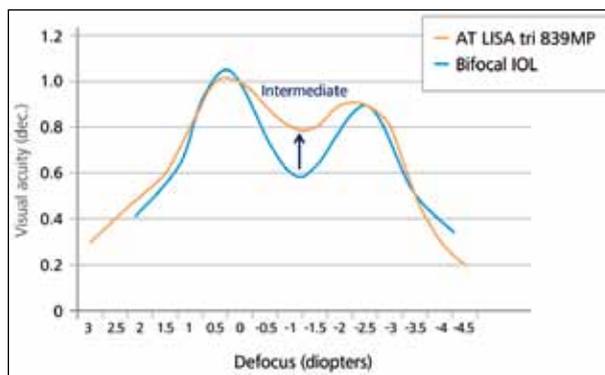


Figure 1. Monocular defocus curve of the AT LISA tri 839MP versus a bifocal IOL.

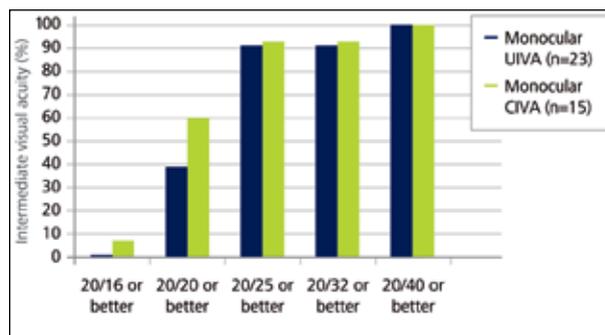


Figure 2. AT LISA tri 839MP intermediate visual acuity.

capsular bag. Additionally, the trifocal optic design provides specific foci for far, intermediate, and near vision, and it also is designed to correct aberrations to provide sharp vision at every distance.

## INDICATIONS: CLEAR LENS EXTRACTION

Thus far, my main indication for implantation of the AT LISA tri is clear lens extraction. Typically patients who elect clear lens extraction are between the ages of 55 and 65 years old and require exceptional intermediate vision for computer use without sacrificing near or far vision. This IOL is perfectly convenient for patients who need good visual acuity at all distances, and in

## QUESTION AND ANSWER WITH DOMINIQUE PIETRINI, MD

**Question: In your opinion, what is the largest advantage of the AT LISA tri lens design?**

*Answer: There is one thing that I like most about the overall design of the trifocal IOL, and that is its pupil independency. This is of the utmost importance, especially in patients with large mesopic pupils, because it will still provide excellent visual performance at any pupil size. Also, the visual performance for intermediate, near, and far are equal regardless of the pupil size. This is especially important for mesopic pupils.*

**Question: Why do you feel the AT LISA tri is the best multifocal IOL you can offer your patients?**

*Answer: This lens has so many advantages compared with previous generations of multifocal IOLs, where you had only two visual foci. The bifocal AT LISA is a great lens, and patient satisfaction is high, but there can be a lack of vision in the intermediate range, which is especially important for our young and active patients. This is where the AT LISA tri is so much better, because this evolution in IOL design provides maximum intermediate vision without sacrificing near or far vision.*

*We know that near vision is important, but, in the clinical experience, intermediate is also very important—it is at least as important as near vision, if not more important. Because the AT LISA tri increases the performance of the entire optical system, I know it is the most appropriate choice for my patients. We have tried to mix-and-match lenses, and although this improves vision at certain distances, the patient does not always find it satisfying. Additionally, we know it is better to implant an IOL with the same multifocality in both eyes, and that is also why the AT LISA tri is such a good option, because it provides patients with good vision at all distances without having to employ a mix-and-match technique with different IOL multifocalities.*

**Question: In your personal experience implanting the AT LISA tri, how comfortable are your patients with their vision at all distances?**

*Answer: Patient satisfaction is always very high with multifocal IOLs, as long as the surgeon spends time before surgery explaining the possibility for visual side effects such as halos and glare. Patients must understand that there will always be some type of visual disturbances after multifocal lens implantation, but that these disturbances will decrease over time as part of the neural adaptation process.*

*With that said, the better the design of the lens, the higher the patient satisfaction will be. I have found that patient satisfaction with the AT LISA tri is exceptional; patients are truly happy with their vision at all distances after surgery. The other important thing is the AT LISA tri aberration-correction design, because we know that when aberration is corrected, vision for each focus is very sharp.*

many cases spectacle independence can be achieved for most daily visual tasks.

The AT LISA tri is the perfect IOL for young patients for two reasons. First, the platform is pupil independent. Younger clear lens extraction patients are likely to have a larger pupil than older patients who present for cataract surgery, and they need an IOL that can provide good visual acuity, even in low light conditions. Second, most young clear lens extraction patients are active and do a fair amount of computer work, and this lens provides improved intermediate vision compared with the AT LISA bifocal or other multifocal lens designs.

**PATIENT SATISFACTION**

Patient satisfaction is a very important consideration when selecting the appropriate IOL to implant, especially for clear lens extraction patients

who are paying out of pocket for a premium lens. I have been impressed with my patients' responses to the AT LISA tri, and patient satisfaction has been extremely high, even in the young presbyopic population. In fact, I have noticed that results seem to be better in younger patients because they typically have a healthy retina.

This lens does not compromise vision at any distance, and the main advantage I have seen—and patients appreciate—is that, in most cases, glasses are no longer required for computer work as they may be with the bifocal AT LISA. The principle of the trifocal AT LISA is to provide sharp vision at all distances, and this is achieved through the optic of the IOL, which is an aberration-corrected design.

Additionally, the neural adaptation time with the AT LISA, both the bifocal and trifocal models, is extremely short. Most patients have an immediate

In my personal experience, [the AT LISA tri] provides patients with excellent functional vision at all distances as early as the day after surgery.

neural adaptation, with sufficient near, intermediate, and far vision the day after surgery. Likewise, patients no longer complain of visual disturbances such as halos or glare postoperatively. This is similar to my experience with the bifocal lens. If halos are present after surgery, patients are not bothered by them and typically decrease with time, disappearing in approximately 1 month or less.

## CONCLUSION

At this time, I think that one of the best indications for the AT LISA tri is clear lens extraction. Patients who choose a lens-based option for correction of refractive errors expect spectacle independence and improved vision at all distances, and with such demanding needs I prefer to use an IOL that I know can deliver these requests. I know that the vision provided by this type of IOL is very complete, and it is perfectly suitable for the patient with high expectations. ■

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# AT LISA tri: The Closest Thing to Natural Accommodation

Patient satisfaction is very high with this trifocal lens design.

BY WOLFRAM WEHNER, MD

A young and healthy eye, one that has full accommodative amplitude, can switch between distance and near foci in approximately 350 milliseconds. However, as the eye ages and the degree of accommodative amplitude decreases, humans lose their ability to shift gracefully between images at different distances. An eye that once had up to 15.00 D of accommodative amplitude in youth quickly decreases to fewer than 2.00 D of accommodation by the time a patient hits their 40s or early 50s. By the age of 70, accommodation decreases to nearly 0.00 D.

Once accommodative loss occurs, there are several options for the patient: (1) spectacle correction with bifocal, reading, or progressive addition lenses, (2) multifocal contact lenses, (3) laser vision correction such as LASIK or presby-LASIK, or (4) clear lens extraction with implantation of a presbyopia-correcting IOL. Although none of these options is a true solution for presbyopia and the loss of accommodative amplitude that coincides with aging, I believe that the



**Figure 1.** Implantation of the AT LISA tri with the preloaded BLUEMIXS 180. The lens is implanted through a 1.8-mm incision.

closest substitute for the natural accommodating lens is implantation of the AT LISA tri 839MP (Carl Zeiss Meditec). Simply put, there is no other IOL on the market that is as close to the natural accommodating process as the AT LISA tri. That is why this lens is the

## QUESTION AND ANSWER WITH WOLFRAM WHENER, MD

**Question: Are there any differences between the AT LISA tri 839MP and the AT LISA bifocal lens?**

*Answer: In my opinion, the trifocal lens has a slight advantage over the bifocal lens in that it enhances intermediate vision. To date, my patients have not reported any visual disturbances such as halos and glare. However, all of the other things about these two lenses are the same.*

**Question: Speaking of intermediate vision, can you elaborate on the intermediate visual quality with the AT LISA tri?**

*Answer: I will say that patients have mentioned that their visual acuity at 80 cm is better than it is at 40 cm with the AT LISA tri; however, there is no feeling that vision at 40 cm is worse than it was preoperatively with reading glasses. In general, patients are satisfied with their vision at 40 cm but notice that their vision at 80 cm is the sharpest range of vision that they have.*

**Question: Why do you think that patients feel that they have their best vision in the intermediate range?**

*Answer: The construction of the trifocal lens design distributes light to three foci: one for far (50%), one for intermediate (20%), and one for near (30%). With the bifocal lens, 65% of light distribution is designated for far and 35% for near vision. Patients may have less light distribution for far and near vision with the AT LISA tri, but they are gaining a new zone—the intermediate zone. The way I see it, there is no drawback to adding a third component to light distribution. They gain excellent intermediate vision and are able to maintain their vision at near and far.*

best solution for our patients who present with presbyopia.

**CLEAR LENS EXTRACTION, CATARACT SURGERY**

As the newest design on the AT LISA platform, the AT LISA tri builds off of the successful platform of the AT LISA bifocal lens. Instead of splitting light between near and far foci, it splits light into three foci, one for each range of vision. Since I was introduced to the AT LISA tri, I have implanted this lens in more than 30 patients (Figure 1). In the majority of cases, my patients have not been able to distinguish between the AT LISA tri and their own natural lens before the incidence of presbyopia—that is how close the accommodative amplitude is with this IOL.

The AT LISA tri can be part of a clear lens extraction strategy for presbyopia correction, and it can also be advantageous as an implant after cataract surgery. The reason that I choose to implant this trifocal lens in presbyopic eyes is because its benefits are fully realized in those who need exceptional intermediate vision, such as young patients who are still working and patients who do a lot of computer work.

One of the largest benefits of the AT LISA tri compared with other multifocal IOLs that only have two foci is that patients achieve better intermediate vision without spectacle correction. This is especially appreciated in young presbyopes who have not yet learned to accept their loss of accommodative amplitude and do not wish to wear spectacles for any visual tasks.

**TAKE CUES FROM THE PATIENT**

Each patient has a unique set of visual needs and desires. In my opinion, we must learn to treat every patient as an

individual, customizing treatment to achieve his or her goals. I have treated retired patients as well as those who are still working full time; I have treated patients who do a lot of computer work and those who do little to none; I have

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Simply put, there is no other IOL on the market that is as close to the natural accommodating process as the AT LISA tri.

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treated patients who drive a lot at night and those who do not even get behind the wheel of a vehicle. Patients from all walks of life can have successful outcomes after IOL implantation, as long as a systematic preoperative process is used to educate and inform them of their choices.

In my experience, younger patients get the most benefit from presbyopia-correcting IOLs, because they are used to having almost complete accommodative amplitude. This option provides the best chance for achieving good vision at near, intermediate, and far ranges. On the other hand, older patients can also enjoy success with presbyopia-correcting IOLs, and specifically the AT LISA tri, if extra time is taken to explain the neural adaptation process. Older patients often need additional time, maybe weeks, to feel comfortable with their new visual system created with a bifocal or trifocal lens design.

Taking cues from your patients is the best way to ensure that visual requirements are met and that patients are satisfied after surgery. With that said, I believe that

The AT LISA tri is one of the unique lenses that can be advantageous in the majority of patients I treat, regardless of their lifestyle or age.

the AT LISA tri is one of the unique lenses that can be advantageous in the majority of patients I treat, regardless of their lifestyle or age. For this reason, it is the lens I see myself using with more frequency over the coming months and years.

#### PATIENT SATISFACTION

One of the reasons I am so readily embracing use of the AT LISA tri is that patients are satisfied with their visual acuity after surgery. Most specifically, they are impressed with the amount of intermediate vision they gain after lens implantation, and they have not reported visual disturbances such as halos and glare. In fact, I have had to explain what halos are to many of my patients. Even so, I am sure to mention the risk for halos and glare after surgery, as they are common side effects associated with all presbyopia-correcting lenses. Therefore, if halos are noticeable, the patient will understand that they will decrease over time as the eye adjusts to the optical artifacts.

In my experience, patients with hyperopia are the happiest with the AT LISA tri, as highly myopic patients are likely to need more time to adjust to the trifocality. I think that is because, at

-7.00 or -6.00 D, the myopic patient does not need glasses for near-vision tasks such as reading. After surgery, they will have a slight loss of these high myopic advantages. However, after just a few weeks or up to a maximum of 2 to 3 months, patients with myopia will adjust to this loss of high myopic advantages.

It is also important to tell patients specifically what they can expect to achieve after surgery. First, I ask the patient if he or she is aiming for spectacle independence and/or is uncomfortable wearing reading glasses. This is a good indication for a multifocal IOL, such as the AT LISA tri. I describe the advantages and side effects associated with these lenses, such as visual artifacts, and also inform the patient that after a period of neural adaptation these artifacts should disappear. This is especially important to explain to older patients, as in my experience they need more time adapting to their new visual system.

#### CONCLUSION

It is true that no one technology available today is the perfect solution for presbyopia correction, but the AT LISA tri is the best alternative we can currently offer our patients. No other lens design provides the same complete range of vision for near, intermediate, and far foci without compromises. ■

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# Spectacle Independence: Now a Likely Outcome

In this small study, 100% of patients who received the AT LISA tri did not need spectacle correction for any distance.

**BY ELISABETH FRIELING-REUSS, MD**

One of the first things that many of my cataract surgery patients tell me in response to the question, "What do you want to achieve after surgery?" is that they wish to be spectacle independent. The second most desirable outcome my patients mention is being able to switch naturally between

near, intermediate, and far vision without any outside influences such as light conditions.

In the past, I used to tell my patients that spectacle independence for all visual tasks and in all situations is seldom achieved. However, I have had to modify my response since I began implanting the AT LISA tri 839MP

(Carl Zeiss Meditec). This lens does indeed provide good visual acuity at all distances and, in fact, 100% of my patients have reported no longer needing spectacle correction.

The AT LISA tri is the latest innovation in multifocal IOL designs. It combines refractive and diffractive profiles and, instead of providing the patient with two foci (one for near and one for far), it provides patients with three (one at each distance). This design seems to result in optimal image quality while reducing the presence of halos and glare, the two most common patient complaints after multifocal IOL implantation. For these and other reasons, I have found that the AT LISA tri improves upon the last-generation AT LISA bifocal. Results with the bifocal lens were excellent, but some patients found that their intermediate vision was less than desirable. However, with the AT LISA tri, there is no longer a visual compromise with intermediate vision, and patients still achieve good near and far vision.

#### BETTER INTERMEDIATE VISION

So far, I have implanted the AT LISA tri in seven patients, and in each case this lens significantly improved intermediate vision without compromising near and far vision. The near and far visual acuities in these patients was approximately 20/20, and the intermediate visual acuity was between 20/20 and 20/25. In comparison to the bifocal AT LISA, visual disturbances such as halos and glare also were much lower. In fact, one-third of patients did not even notice halos after surgery. When halos have been noticeable, patients reported a decrease in their presence within 1 to 3

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With the AT LISA tri, there is no longer a visual compromise with intermediate vision, and patients still achieve good near and far vision.

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months after surgery. There have also been no reports of glare in this patient population.

These two crucial points are enough reason to favor the AT LISA tri, in my opinion. I intend to continue implementing the use of this trifocal lens design in my patients, especially in younger patients who desire spectacle independence and favor intermediate vision. However, there are other reasons that I like the AT LISA tri. First, it is just like the AT LISA bifocal in that it is easy to implant using the BLUEMIXS 180 injector for pre-loaded IOLs (Carl Zeiss Meditec; Figure 1; video available at [eyetube.net/?v=nesev](http://eyetube.net/?v=nesev)), stable in the capsular bag, and has an aberration-correcting aspheric optic design to provide maximal pupil independence and sharp functional vision.

#### STUDY

I started implanting the AT LISA tri in June 2011. In a little more than 6 months, I have noticed that my patients no longer require spectacle correction for near, intermediate, or far vision tasks. With the bifocal AT LISA, the majority of patients still achieved spectacle independence; however, 10% required correction for intermediate vision. The improvement in vision

#### QUESTION AND ANSWER WITH ELISABETH FRIELING-REUSS, MD

**Question: Can you elaborate on the rate of halos in the patient population implanted with the AT LISA tri?**

*Answer: I think it is important to distinguish between recognizing halos and being disturbed by halos. It is true that patients are likely to recognize the presence of halos after AT LISA tri implantation—and after implantation of any multifocal IOL, actually—but the majority of patients are not disturbed by them.*

**Question: Can you briefly describe your preoperative examination process as well as your procedure for postoperative follow-up care?**

*Answer: Preoperative exams include IOLMaster biometry (Carl Zeiss Meditec), optical coherence tomography, and keratometry. I use a very intensive biomicroscopic examination process to make sure that the anterior and posterior segment are both healthy. It is important to make sure that the macula and cornea are both clear and healthy and that there is nothing to disturb the intermediate vision after the trifocal lens is implanted.*

*One day after surgery, I do a biomicroscopic eye exam including intraocular pressure and visual acuity. Usually on day 4 or 5, I will again check these parameters as well as perform a complete refractive work-up, which is repeated at 1-month postoperative.*



Figure 1. The BLUEMIXS 180 preloaded injector.

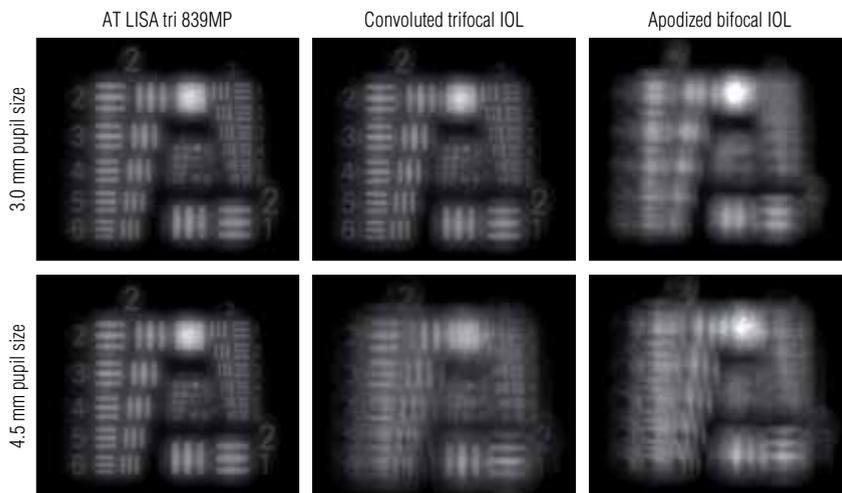


Figure 2. Intermediate vision of the AT LISA tri versus intermediate vision with a convoluted trifocal and apodized bifocal IOLs. As depicted here, the AT LISA tri displayed better intermediate visual performance, even under poor light conditions.

with the AT LISA tri, most specifically in intermediate vision, is also evident when compared with the performance of a convoluted trifocal IOL as well as an apodized bifocal IOL (Figure 2; data on file with Carl Zeiss Meditec). This improvement is noticeable under any lighting condition.

I have modified my patient selection process for the AT LISA tri. I now make sure that patients have no more than 0.70 D of astigmatism and no sign of corneal or macula disease. Additionally, I am very careful to educate patients before surgery, explaining that spec-

tacle independence can be achieved after a brief period of neural adaptation. However, I also make sure that patients understand that spectacle independence is not guaranteed.

Thus far, patient satisfaction has been very good. I use a patient satisfaction questionnaire that includes the following questions:

1. Do you need spectacle correction for near vision?
2. Do you need spectacle correction for intermediate vision?
3. Do you need spectacle correction for distance vision?
4. Are you comfortable with your overall vision?
5. Is the reading distance comfortable for you?
6. Is intermediate distance comfortable for you?
7. Is far distance comfortable for you?
8. Have you noticed any visual disturbances such as halos?

Patients were asked to rate their responses from 1 to 6, with 1 being the best and 6 being the worst. All but one patient responded with 1s in every category. I have analyzed postoperative data for the first five patients

I implanted with the AT LISA tri.

One month after surgery, three patients had 20/20 intermediate UCVA and two had 20/25 intermediate UCVA. This was measured at 80 cm.

#### TAKE-HOME MESSAGE

The take-home message for me has been that patient satisfaction is even higher with the AT LISA tri than it is with the AT LISA bifocal. The major difference between these lenses is that the new trifocal design provides better intermediate vision, a visual range that is very important to patients today, especially for those who are still working and lead an active lifestyle. If the patient uses the computer often, if he or she is still working, or if he or she has

hobbies that require near and intermediate vision, I know that the first lens I recommend will be the AT LISA tri. But the bottom line is that we decide on the best lens together. ■

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# A Preference for the Mix-and-Match Technique

By implanting the AT LISA tri in the nondominant eye and the AT LISA bifocal in the dominant, patients can achieve optimal visual acuity.

**BY PASCAL ROZOT, MD**

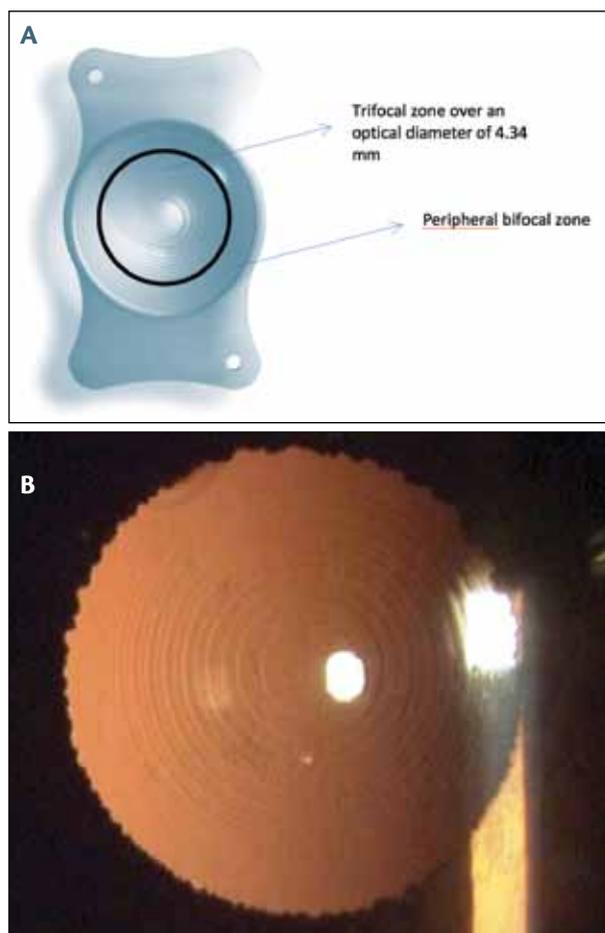
I have been using the AT LISA IOL platform (Carl Zeiss Meditec) for almost 6 years. What originally attracted me to this lens design was its asymmetrical distribution of light, providing 65% of the light for distance focus and 35% for near focus to improve intermediate vision and reduce the incidence of halos and glare. I also liked the prospect of the lens' optimized aspheric optic to correct aberrations.

What immediately became clear after I implemented use of the IOL in my own practice was that the AT LISA did provide my patients with better contrast sensitivity and depth of field than some of the other multifocal IOLs I have experience with. However, patients also noticed a lack of intermediate visual quality, especially for computer use. This trade-off was worthwhile for some patients, but others desired better intermediate vision, and I began using a mix-and-match strategy with other multifocals to provide patients with the full benefit of the AT LISA while still achieving good intermediate vision. I have experience with many multifocal lens designs, so it was easy for me to select another lens to compliment the advantages of the AT LISA.

Recently, Carl Zeiss Meditec introduced a trifocal lens design of the AT LISA (Figures 1 and 2). The AT LISA tri 839MP still distributes light asymmetricaly to produce different foci, but instead of two areas for light distribution there are now three. The light is distributed as follows: 50% for far, 20% for intermediate, and 30% for near foci. The third focus was added to further increase visual acuity in the intermediate range, a feat that I believe this lens does indeed accomplish.

## BETTER INTERMEDIATE VISION

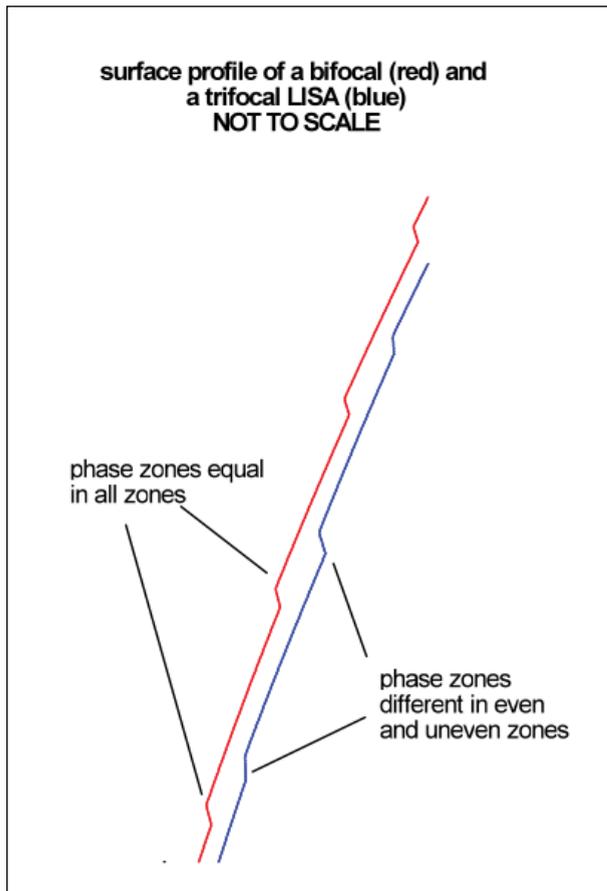
I was among the first surgeons in Europe to implant the AT LISA tri, and although it was hard to know what to expect with such a unique lens design, my patients began reporting better intermediate vision. In the 10 patients I implanted with this lens in a pre-



**Figure 1. (A) The AT LISA tri 839MP platform. (B) Slit-lamp photo of an AT LISA tri lens.**

liminary study, I concluded that the AT LISA tri provided more satisfying and predictable visual outcomes regardless of age or pupil size. A second prospective study is currently ongoing to confirm these results.

I used a mix-and-match technique in several of the cases during the preliminary study, as I prefer this strategy in patients who may have difficulty adapting to a new optical system or in those who require excel-



**Figure 2.** Comparison of diffractive patterns of the bifocal and trifocal AT LISA.

lent visual acuity at multiple distances. For instance, one of my younger patients underwent cataract surgery 2 years ago and received the bifocal AT LISA. He was happy with the overall outcome but noted that intermediate vision in the implanted eye was not as strong as in the noncataractous, nonimplanted eye. By the time cataract developed in the second eye, I was able to implant the AT LISA tri. This lens gave the patient a better result, and he was instantly pleased with the amount of intermediate vision he had gained. We must remember that this is only one example, but the result is quite clear: the patient's subjective results were that this new optical system with the AT LISA bifocal and trifocal lenses was both pleasing and effective.

After this case, I became even more interested in the mix-and-match strategy using the trifocal and bifocal AT LISA lenses. I found that the biggest advantage of the AT LISA tri—sharp intermediate vision—is even more enhanced when it is implanted in the nondominant eye, because the dominant eye can then be dedicated to far vision. In these cases, the nondominant eye will have three foci, with light split 50% for

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far, 20% for intermediate, and 30% for near foci, and the dominant eye will have two foci, with light split 65% for far and 35% for near vision.

### CHOOSING A STRATEGY

The AT LISA tri can also be implanted in both eyes and is an especially useful strategy in young patients with excellent retinas. One important thing to remember is that, for every diffractive pattern, there is a loss of incident light. As a result, some patients complain of lower contrast sensitivity for far vision because more light is shared between foci. But, for instance, when clear lens extraction patients want to achieve excellent far, intermediate, and near vision, it is best to implant the AT LISA tri in both eyes.

Because I have perfected a very careful surgical technique, I prefer to implant the bifocal AT LISA in the dominant eye and the AT LISA tri in the nondominant eye in the majority of my patients. The near addition of the trifocal lens is just a bit lower than the bifocal design (3.33 D vs 3.75 D), the distance for reading is a bit longer with the trifocal, and the intermediate addition is 1.66 D for the AT LISA tri. This combination provides patients with excellent far vision, a comfortable near vision for reading, and great intermediate vision.

### CONCLUSION

The AT LISA tri provides patients with better intermediate vision, which is especially appreciated when using the computer or when in social situations. Whereas I prefer to implant the AT LISA tri in the nondominant eye only, thereby using a mix-and-match technique to achieve the best opportunity for spectacle independence, this lens can also be implanted bilaterally in patients to achieve a similar end result. The AT LISA bifocal and the AT LISA tri lenses are both independent from the pupil, which can be an advantage, especially for older patients.

Will the AT LISA tri lens extend the range of patients I use premium IOLs in? The answer is a resounding yes. This lens is perfect for people who

## QUESTION AND ANSWER WITH PASCAL ROZOT, MD

**Question: Are there any surgical pearls you can share with regard to implanting the AT LISA?**

*Answer: One of the things I have noticed is that posterior capsular opacification can occur if you do not thoroughly polish the lens capsule; however, this is the case for all multifocal IOLs. I have been sure to polish the posterior capsule methodically, and this has avoided the need for Nd:YAG capsulotomy up to 3 years postoperatively. The AT LISA platform is excellent, and I am able to inject the IOL using the BLUEMIXS 180 injector (Carl Zeiss Meditec) through a 1.8-mm incision. This injector is used with ZEISS preloaded IOLs, and in my opinion it is one of the best injectors on the market.*

**Question: Have you noticed a low rate of halos and glare after implanting the AT LISA tri?**

*Answer: In my experience, the rate of halos and glare has been the same with the trifocal lens as it is with the bifocal lens, and they are both really low (about 15% halos and 10% glare). Patients might recognize halos, but they are not visually disturbing and tend to disappear within the first few weeks to months.*

**Question: Can you briefly discuss patient satisfaction with the AT LISA tri?**

*Answer: I think the AT LISA lens platform is one of the most tolerated multifocal lenses on the market in terms of visual disturbances, and I have not had to explant or exchange this lens in any case. Patient satisfaction has been high, and at this moment there are no complaints.*

use the computer frequently or who favor intermediate vision tasks. The next step, I hope, is that the AT LISA tri will be available in a toric design as well. Then my indications for the AT LISA will increase even further. ■

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