Recommendation for Presbyopia-Correcting Intraocular Lenses: A Delphi Consensus Statement by the ESASO Study Group

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• PURPOSE: To establish consensus among experts in lens and refractive surgery to guide general ophthalmologists on issues related to presbyopia-correcting intraocular lenses (IOLs).
• DESIGN: A modified Delphi method to reach a consensus among experts.
• METHODS: A steering committee formulated 105 relevant items grouped into four sections (preoperative considerations, IOL selection, intraoperative considerations, and postoperative considerations). The consensus was defined as ≥ 70% of experts agreeing with the evaluation of a statement.
• RESULTS: Ten experts participated and completed all rounds of questionnaires (100% response rate). Of 68 items considered in the preoperative considerations, consensus was achieved in 48 (70.6%). There was a lack of consensus over IOL selection, the experts only agreed on the importance of the patient's habits for the optical IOL design selection. Of the 14 considerations related to intraoperative issues, the experts reached a consensus on 10 (71.4%). The postoperative considerations section reached the highest consensus in 10 items of 13 (76.9%).
• CONCLUSIONS: Key recommendations for a diffractive multifocal IOL were a potential postoperative visual acuity > 0.5, a keratometry between 40-45 diopters, a pupil >2.8 mm under photopic conditions and <6.0 mm under scotopic conditions, a root mean square of higher order corneal aberrations <0.5 µm for 6-mm pupil size, while monofocal or non-diffractive IOLs should be considered for patients with coexisting eye disorders. A lack of agreement was found in the issues related to the IOL selection. **(Am J Ophthalmol 2023;253: 169–180.**

INTRODUCTION

Lens surgery is one of the most common surgical procedures performed worldwide. Since Sir Harold Ridley implanted the first intraocular lens (IOL) in 1949, the technology and knowledge have evolved, making lens surgery with IOL implantation a very safe and successful procedure. Currently, most implanted IOLs are standard monofocal lenses, which provide outstanding visual restoration at a single distance. However, surgeons are fully aware that the success of lens surgery depends on patients' satisfaction after surgery, which in turn relies on achieving the expected visual results.

The expanded use of technology in modern everyday life (e.g., tablets, smartphones, laptops, and speedometers on dashboards) has made good unaided intermediate (63 cm) and near (40 cm) vision more important.[1] Standard monofocal IOLs may no longer meet the visual demands of a population increasingly interested in activities that require good-quality intermediate and near vision.

So-called presbyopia-correcting IOLs aim to improve intermediate and near vision compared with standard monofocal IOLs. Current presbyopia-correcting IOLs can be clas-

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sified into two groups: multifocal IOLs, which split incoming light into multiple foci (bifocal or trifocal IOLs) through diffractive-based designs; and extended depth-of-focus (EDOF) IOLs, which aim to improve intermediate vision using diffractive or non-diffractive designs. Both modalities have been recognized as effective treatments for aphakia and presbyopia.[2] With the great variety of IOL designs, finding the best IOL for each patient is particularly challenging. There are many clinical and laboratory studies on presbyopia-correcting IOLs describing the main advantages and drawbacks of each IOL design;[3-5] however, the clinical studies are typically conducted in highly selected populations with specific interventions or requirements that may not reflect the spectrum of potential patient candidates encountered in routine practice. Therefore, many controversies in IOL selection for individual patients remain unresolved, including patient selection, suitable preoperative tests, and medical and surgical management.

To address controversial and complex issues in medicine and health care, aiming to establish guideline recommendations, formal consensus methods among experts have been shown to be powerful tools.[6] One such tool is the modified Delphi method. This study aimed to present a consensus regarding presbyopia-correcting IOLs from an international panel of ophthalmology experts using a Delphi method. The consensus covers questions regarding preoperative considerations, IOL selection, and intraoperative and postoperative management.

METHODS

A modified Delphi method was used to reach a consensus among a panel of experts in lens and refractive surgery on the most relevant issues related to presbyopia-correcting IOLs. The Delphi method has previously been employed to reach a consensus among experts in several ocular diseases, such as dry eye management, keratoconus, glaucoma, and age-related macular degeneration, among others.[7-17] Briefly, this method aims to reach a consensus by formulating sequential questionnaires for an expert panel who answer anonymously. Questioning involves two or more rounds. Participants analyze the results and feedback in each round and reformulate or modify those statements or recommendations where a consensus is not obtained until an agreement is reached.

The European School for Advanced Studies in Ophthalmology (ESASO) promoted the study. The Steering Committee comprised three cornea specialists (V.R., L.F-V-C., and D.M-C.), who oversaw the preliminary review of the literature and formulated 105 relevant items grouped into four sections (preoperative considerations; IOL selection; intraoperative considerations; and postoperative considerations). The Steering Committee members selected the experts based on the following criteria:

- Ophthalmologists with experience in the implantation and management of presbyopia-correcting IOLs.
- Authorship of scientific publications with an H index > 10 or at least 10 peer-review papers on presbyopia refractive.
- Wide recognition by the community.
- Willingness to contribute to the question rounds, online meetings, and project timelines.

In the first round of voting, experts responded to a questionnaire comprising 105 statements using an online format that also allowed comments to be made. The questionnaire had numerical and categorical responses. In variables with a numerical scale, experts received instructions to grade the importance from 1 (not important) to 10 (very important). To evaluate the consensus, the numerical answers were clustered in categories as follows: 1 to 3 (not important); 3 to 6 (relatively important); $\geq$ 7 (important). Then, the consensus was defined as $\geq$70% of experts agreeing with the evaluation of a statement. Those parameters where scoring demonstrated consensus amongst the expert panel were accepted as a relevant characteristic and were then closed and not presented in subsequent survey rounds. For those statements with non-consensus, the experts provided free-text answers to newly formulated questions in the second round. The steering committee analyzed these answers and evaluated the items that could be reformulated. Items that could not be rephrased after the second-round assessment were classified as "non-consensus." By contrast, for those statements that the initial question could be reformulated, a third round of questions was launched in which the experts responded with a binary answer (agree/disagree). The consensus was defined again as $\geq$70% of experts agreeing with the response.

Descriptive statistics were computed using percentages for categorical questions and medians for numerical rank questions (quantitative value). The analysis was performed using Excel (Microsoft).

RESULTS

The study was conducted from June 2022 to October 2022. Ten experts were invited to participate; all 10 accepted the invitation and completed the three rounds of questionnaires. The participating experts were the following: J.A., J.A., B.A., R.A., G.A., F.C., R.K., J.M., M.N., and G.S. A 100% response rate was achieved in all rounds. Overall, experts reached a consensus on 56 items in the first round (53.3%). Of the 49 statements where the agreement was not obtained, the steering committee reformulated 15 items (30.6%) after the second round (Tables 1B, 2B, 3B, 4B, and 7B). Of these, the experts reached a consensus in 13 items. Globally, an agreement was achieved in 69 items (65.7%).

TABLE 1A. How Important Are the Following Factors in Recommending a Presbyopia-Correcting Intraocular Lens?

Variable	Median	% Consensus	Agreement
1. Age	8.0	90	YES
2. Patient's habit	8.0	80	YES
3. Patient's work	8.0	80	YES
4. Patient motivation	8.5	90	YES
5. Visual acuity	8.0	70	YES
6. Refraction	7.5	70	YES
7. Axial length	5.5	40	No agreement after the third round
8. Keratometry	6.0	40	Agreement in the third round
9. White to White	2.5	70	YES
10. IOL power	5.5	50	Agreement in the third round
11. Anterior chamber depth	4.0	40	No agreement after the third round
12. Pupil size	7.5	70	Agreement in the third round
13. Pupil dynamic	7.0	50	Agreement in the third round
14. Residual accommodative power	6.5	50	NO
15. Corneal transparency	10	100	YES
16. Corneal endothelium	10	100	YES
17. Macula status	10	100	YES
18. Optic nerve status	10	90	YES
19. Retina status	10	100	YES

• **PREOPERATIVE CONSIDERATIONS:** Tables 1A to 3A show the outcomes of the preoperative considerations section. This was the section with the highest number of items. Of 68 items, consensus was reached in 48 (70.6%). Of note, in the items related to comorbidities and whether they represented a contraindication or not (Table 2A), there was agreement that they represented a contraindication in four conditions: previous uveitis, previous squint surgery, epiretinal membrane, and previous ocular surgery; however, there was no agreement on the level (absolute or relative).

• **INTRAOCULAR LENS SELECTION:** The "IOL selection" section yielded a significant lack of consensus. There was a significant discrepancy among experts on the important parameters for choosing the IOL characteristics (material, platform, and optic design). The experts only agreed on the importance of the patient's habits for the optical IOL design selection (Table 4A). The experts reached a complete consensus that the IOL power should be calculated with modern formulas (e.g., Barrett UII/ Kane) (Table 4B). Almost all the experts agreed that the IOL material for diffractive IOLs should be hydrophobic or hydrophilic with a hydrophobic surface and that a diffractive design is not mandatory for a presbyopia-correcting IOL (Table 4B).

• **INTRAOPERATIVE AND POSTOPERATIVE CONSIDERATIONS:** Of the 14 items related to intraoperative issues (Tables 5 and 6), the experts reached a consensus in 10 (71.4%). Postoperative considerations was the section with the highest consensus. Of the 13 items (Tables 7A and 8), an agreement was reached in 10 (76.9%).

DISCUSSION

Since the introduction of the first multifocal IOLs in the 1980s, the technology developed for presbyopia-correcting IOLs has significantly evolved. This design evolution has been driven by demand for greater spectacle freedom throughout the visual range within the contemporary patient population. The number of presbyopia-correcting IOLs available in the market has also significantly expanded. In their review on multifocal and EDOF IOLs in 2020, Rampat and Gatinel[3] found at least 70 presbyopia-correcting IOLs on the international market. Although newer lens designs perform well, the trade-off between greater spectacle freedom and visual side effects remains an important consideration. As the ASCRS Cataract Clinical Committee stated,[18] "not every currently available IOL is suitable for every patient." This study aimed to establish guideline recommendations through a consensus expert panel in four key areas for presbyopia-correcting IOLs implantation success: preoperative considerations, IOL selection, intraoperative management, and postoperative management. Before discussing the results, the reader is reminded that this study was based on experts' opinions, not evidence-based research; consequently, the outcomes of this survey should be considered a guide. These recommendations only relate to a snapshot in time and may change as future tests and IOL designs become available. It is also important to note that an agreement was reached when ≥70% of the experts agreed with a statement; consequently, there were items in which all or almost all experts agreed, while others, despite being labelled as agreement, where three experts disagreed.

TABLE 1B. (Third-Round Questions). Do You Agree With the Following Statements?

Statements	Yes (%)	No (%)	Uncertain	Agreement
Potential visual acuity **(item 5):** • For patients with a potential postoperative CDVA < 0.5 (Snellen Scale), surgeons should consider an extended depth-of-focus IOL or non-diffractive IOL design. • For patients with a potential postoperative CDVA > 0.5 (Snellen Scale), a multifocal IOL may be recommended.	7/10 (70%)	2/10 (10%)	1/10 (10%)	YES
Axial length **(item 7)** • **<22 mm:** recommended with precaution for refractive surgeons at first approach. • **Between 22-27 mm:** recommended for refractive surgeons at first approach. • **>27 mm:** recommended with precaution for refractive surgeons at first approach.	5/10 (50%)	5/10 (50%)	0/10 (0%)	NO
Keratometry **(item 8)** • **<40 D:** recommended with precaution for refractive surgeons at first approach. • **Between 40-45 D:** recommended for refractive surgeons at first approach. • **>45 D:** recommended with precaution for refractive surgeons at first approach.	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES
IOL power **(item 10)** • **<10 D:** recommended with precaution for refractive surgeons at first approach. • **Between 10-27 D:** recommended for refractive surgeons at first approach. • **>27 D:** recommended with precaution for refractive surgeons at first approach.	7/10 (70%)	3/10 (30%)	0/10 (0%)	YES
Anterior chamber depth **(item 11)** • **<2.5 mm:** recommended with precaution for refractive surgeons at first approach. • **Between 2.5-3.8 mm:** recommended for refractive surgeons at first approach. • **>3.8 mm:** recommended with precaution for refractive surgeons at first approach.	6/10 (60%)	4/10 (40%)	0/10 (0%)	NO
Pupil size/dynamics **(items 12 and 13)***Scotopic* • **<6 mm:** recommended for refractive surgeons at first approach. • **>6 mm:** not recommended for surgeons at first approach. *Photopic* • **>2.8 mm:** recommended for refractive surgeons at first approach. • **<2.8 mm:** not recommended for surgeons at first approach.	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES

Abbreviations: CDVA = corrected distance visual acuity; D = diopter; IOL = intraocular lens.

Regarding preoperative considerations, there was a broad consensus on the importance of age, patient's habit, work, and motivation for recommending a presbyopia-correcting IOL (Table 1A). Although it is challenging to establish cutoff values for the recommended age (both the oldest and youngest), experts consider it an important factor. In the scientific literature, most of the studies included a range of ages between around 50 and 75 years. Obviously, it does not mean that ages out of that range represent a contraindication; nonetheless, they should be managed with more caution, and surgeons should balance age with other preoperative aspects (e.g., patient profile, refraction, and ocular health).

Consensus on the importance of the patient's profile (their habits, work, and motivation) is in line with previous articles,[3,4,18-20] suggesting that a detailed history enquiring about the work, visual expectations, hobbies, and lifestyle is helpful to know the patient's visual requirements and their suitability for a presbyopia-correcting IOL. Oshika and associates[21] reported that the preoperative chair time, the time required in consultation discussions, was twice as long in patients who received a multifocal IOL as in those who received a monofocal IOL.

There was a consensus on the importance of visual and refractive parameters. The experts agreed that the potential postoperative visual acuity is crucial in deciding the type of presbyopia-correcting IOL. For patients with a potential postoperative corrected distance visual acuity (CDVA) < 0.5 (Snellen Scale), experts agreed that surgeons should consider an EDOF IOL or non-diffractive IOL design.

TABLE 2A. Which of the Following Comorbidities Represent an Absolute or Relative Contraindication for Implanting a Presbyopia-Correcting Intraocular Lens?

	Absolute Contraindication	Relative Contraindication	No Contraindication	Uncertain	% Consensus	AGREEMENT
20. Family history positive for ocular disease	0/10 (0%)	5/10 (50%	5/10 (50%)	0/10 (0%)	50	Agreement in the third round
21. Evaporative dry eye	1/10 (10%)	8/10 (80%)	1/10 (10%)	0/10 (0%)	80	YES
22. Aqueous deficient dry eye	3/10 (30%)	7/10 (70%)	0/10 (10%)	0/10 (0%)	70	YES
23. Ptosis	1/10 (10%)	6/10 (60%)	2/10 (20%)	0/10 (0%)	60*	Agreement in the third round
24. Ectropion	2/10 (20%)	8/10 (80%)	0/10 (10%)	0/10 (0%)	80	YES
25. Entropion	2/10 (20%)	8/10 (80%)	0/10 (10%)	0/10 (0%)	80	YES
26. Anisometropia	0/10 (0%)	3/10 (30%)	6/10 (60%)	1/10 (10%	60	NO
27. High myopia >6.0 D	0/10 (0%)	3/10 (30%)	6/10 (60%)	1/10 (10%)	60	NO
28. High hypermetropia >4.0 D	0/10 (0%)	2/10 (20%)	8/10 (80%)	0/10 (0%)	80	YES
29. High regular astigmatism (>5 D)	0/10 (0%)	7/10 (70%)	2/10 (20%)	1/10 (10%)	70	YES
30. Corneal higher-order aberration	2/10 (20%)	6/10 (60%)	2/10 (20%)	0/10 (0%)	60*	Agreement in the third round
31. Keratoconus	8/10 (80%)	2/10 (20%)	0/10 (0%)	0/10 (0%)	80	YES
32. Limbal stem cell deficiency	8/10 (80%)	0/10 (0%)	2/10 (20%)	0/10 (0%)	80	YES
33. Corneal epithelium dysfunction	7/10 (70%)	1/10 (10%)	2/10 (20%)	0/10 (0%)	70	YES
34. Corneal endothelial dysfunction	7/10 (70%)	1/10 (10%)	2/10 (20%)	0/10 (0%)	70	YES
35. Poor dilatation	1/10 (10%)	7/10 (70%)	2/10 (20%)	0/10 (0%)	70	YES
36. Synechiae	1/10 (10%)	8/10 (80%)	1/10 (10%)	0/10 (0%)	80	YES
37. Zonulopathy	5/10 (50%)	3/10 (30%)	2/10 (20%)	0/10 (0%)	50*	Agreement in the third round
38. Previous uveitis	2/10 (20%)	5/10 (50%)	3/10 (30%)	0/10 (0%)	50*	NO
39. Iris defect	3/10 (30%)	7/10 (70%)	0/10 (0%)	0/10 (0%)	70	YES
40. Floppy iris syndrome	0/10 (0%)	6/10 (60%)	4/10 (40%)	0/10 (0%)	60	NO
41. Diabetes without retinopathy	1/10 (10%)	5/10 (50%)	3/10 (30%)	1/10 (10%)	60	NO
42. Diabetic retinopathy	7/10 (70%)	2/10 (20%)	1/10 (10%)	0/10 (0%)	70	YES
43. Squint	4/10 (40%)	5/10 (50%)	1/10 (10%)	0/10 (0%)	50*	Agreement in the third round
44. Previous squint surgery	4/10 (40%)	5/10 (50%)	1/10 (10%)	0/10 (0%)	50*	NO
45. Previous refractive corneal surgery	1/10 (10%)	7/10 (70%)	2/10 (20%)	0/10 (0%)	70	YES
46. Epiretinal membrane	5/10 (50%)	4/10 (40%)	1/10 (10%)	0/10 (0%)	50*	NO
47. Previous intraocular surgery	1/10 (10%)	6/10 (60%)	3/10 (30%)	0/10 (0%)	60*	NO
48. Dry age-related macular degeneration	7/10 (70%)	2/10 (20%)	1/10 (10%)	0/10 (0%)	70	YES
49. Macular drusen	3/10 (30%)	6/10 (60%)	1/10 (10%)	0/10 (0%)	60*	Agreement in the third round
50. Wet age-related macular degeneration	8/10 (80%)	0/10 (0%)	2/10 (20%)	0/10 (0%)	80	YES
51. Peripheral rhegmatogenous retinal degeneration	3/10 (30%)	4/10 (40%)	3/10 (30%)	0/10 (0%)	40*	Agreement in the third round

*≥70% considered as a contraindication (relative or absolute).Abbreviation: D = diopter.

For patients with a potential postoperative CDVA > 0.5 (Snellen Scale), a multifocal IOL may be recommended (Table 1B). There was a consensus regarding the refraction, keratometry and IOL power, and discrepancy in axial length. Experts agreed that a keratometry between 40 to 45 diopters (D) is the most suitable for recommendation of a presbyopia-correcting IOL (Table 1B). Likewise, experts agreed that IOL powers between 10 and 27 D are the most appropriate for presbyopia-correction IOLs (Table 1B); outside those IOL power and keratometry ranges, patients should be managed with more caution. Despite the discrepancy in axial length and the challenge of establishing the axial length cut-off for fewer complications, agreement on IOL power reveals that, in general, short and long eyes should be managed with caution. Eyes with a short axial length may experience a decrease in visual quality with mul-

TABLE 2B. (Third-Round Questions). Do You Agree With the Following Statements?

Statements	Yes (%)	No (%)	Uncertain	Agreement
Family history of positive glaucoma/age-related macular degeneration consider an EDOF IOL or non-diffractive IOL designs **(item 20).**	9/10 (90%)	1/10 (10%)	0/10 (0%)	YES
Squint **(item 43)** • **Good stereopsis:** recommended with precaution for refractive surgeons at first approach. • **Poor stereopsis:** not recommended for surgeons at first approach.	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES
RMS of higher order aberrations for 6-mm pupil size **(item 30).** • **<0.4 µm:** recommended for refractive surgeons at first approach. • **Between 0.4 and 0.5 µm:** recommended with precaution for refractive surgeons at first approach. • **>0.5 µm:** not recommended for surgeons at first approach.	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES
Wavefront analysis: Spherical aberrations postoperatively should not exceed 0.5 µm for 6-mm pupil size **(item 30).**	7/10 (70%)	3/10 (30%)	0/10 (0%)	YES
Capsular bag unstable (PEX, trauma, high myopia) consider monofocal or non-diffractive IOL designs **(item 37).**	10/10 (100%)	0/10 (0%)	0/10 (0%)	YES
A lid malposition should be treated before considering presbyopic-correcting IOL implantation **(item 23).**	9/10 (90%)	1/10 (10%)	0/10 (0%)	YES
In patients with macular drusen, consider DUET procedure, EDOF IOL or non-diffractive IOL designs **(item 49).**	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES
In patients with rhegmatogenous retinal degeneration, a second opinion by the retinal specialist is required and providing treatment if needed. Delay surgery if risky **(item 51).**	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES

Abbreviations: EDOF = extended depth-of-focus; IOL, intraocular lens; PEX = pseudoexfoliation syndrome; RMS = root mean square.

TABLE 3A. How Important Are the Following Tests in Preventing Future Complications After Presbyopia-Correcting Intraocular Lens Implantation?

Variable	Median	% Consensus	Agreement
52. Refraction	7.5	60	NO
53. Corneal topography	9.0	100	YES
54. Corneal tomography	9.0	80	YES
55. Pupillometry static	7.0	70	YES
56. Pupillometry dynamic	7.0	60	NO
57. Eye dominance	7.0	60	Agreement in the third round
58. Contrast sensitivity	5.5	50	NO
59. Schirmer test	7.0	50	NO
60. Tear osmolarity	7.0	50	NO
61. Biometry	10	100	YES
62. Biometry formula	10	100	YES
63. Optical coherence tomography RNFL	7.5	70	YES
64. Optical coherence tomography macula	9.0	90	YES
65. Orthoptic examination	6.0	50	NO
66. Visual field	5.5	60	NO
67. Contact lens trial	4.0	40	NO
68. Aberrometer test	7.0	40	NO

Abbreviations: RNFL = retinal nerve fiber layer.

TABLE 3B. (Third-Round Questions). Do You Agree With the Following Statement?				
Statement	Yes (%)	No (%)	Uncertain	Agreement
Eye dominance is not a mandatory test, except for mix and match strategies **(item 57)**	7/10 (70%)	1/10 (10%)	2/10 (20%)	YES

TABLE 4A. How Important Are the Following Parameters on Material, Platform, or Optic Design Choice for a Presbyopia-Correcting Lens?

	Median	% Consensus	Agreement
69. Age			
Material	4.5	40	NO
Platform	6.5	50	NO
Optic	7.0	50	NO
70. Keratometry			
Material	4.0	40	NO
Platform	4.5	40	NO
Optic	4.5	40	NO
71. White to White			
Material	2.5	50	NO
Platform	5.0	40	NO
Optic	2.0	40	NO
72. Refraction			
Material	2.5	50	NO
Platform	5.0	40	NO
Optic	7.0	50	NO
73. Patient's habit			
Material	2.5	50	NO
Platform	4.5	40	NO
Optic	8.0	70	YES
74. IOL power			
Material	4.0	30	NO
Platform	5.5	40	NO
Optic	9.0	60	NO
75. Anterior chamber depth			
Material	2.5	50	NO
Platform	5.0	40	NO
Optic	4.5	60	NO
76. Pupil size			
Material	2.5	50	NO
Platform	5.0	40	NO
Optic	6.5	50	NO
77. Residual accommodative power			
Material	2.5	50	NO
Platform	3.5	40	NO
Optic	6.5	50	NO
78. Contact lens wearer			
Material	2.5	50	NO
Platform	3.5	50	NO
Optic	4.5	50	NO

Abbreviation: IOL, intraocular lens.

tifocal IOL compared with medium axial length eyes due to minimization of the retinal image.[22-24] Furthermore, shorter eyes have been associated with a higher probability of IOL tilt,[24] as well as higher prediction errors in IOL power calculation.[25] Eyes with a long axial length may have associated comorbidities and a higher risk of suffering future maculopathies, affecting long-term visual performance after presbyopia-correcting IOL implantation.[26,27]

The pupil size is an important aspect when considering a presbyopia-correcting IOL. Large pupils increase the risk

TABLE 4B. (Third-Round Questions). Do You Agree With the Following Statements Regarding the IOL Selection, Intraoperative and Postoperative?

IOL selection	Yes	No	Uncertain	Agreement
Formula: 4° generation (Barrett UII/ Kane) formulas are preferred	10/10 (100%)	0/10 (0%)	0/10 (0%)	YES
IOL material: The IOL material for diffractive IOL design should be hydrophobic or hydrophilic with a hydrophobic surface	8/10 (80%)	2/10 (20%)	0/10 (0%)	YES
IOL design: A diffractive design is not mandatory	9/10 (90%)	0/10 (0%)	1/10 (10%)	YES

Abbreviation: IOL, intraocular lens.

TABLE 5. How Important Are the Following Surgical Steps to Optimize the Outcomes of Presbyopia-Correcting Lenses Implantation?

	Median	% Consensus	Agreement
79. Preoperative eye drops	6.5	50	NO
80. Anesthesia	5.0	40	NO
81. Corneal incision	9.0	80	YES
82. OVD used	8.0	70	YES
83. Rhexis	9.0	90	YES
84. Phacoemulsification technique	6.5	50	NO

Abbreviation: OVD = ophthalmic viscosurgical device.

of experiencing photic phenomena after surgery.[28] Small pupils may require an expansion for safe surgery, and the surgeon should be careful during the expansion maneuver not to provoke damage to the iris sphincter.[29] Furthermore, a small pupil might compromise the optical performance distance of some non-diffractive EDOF IOLs.[30] There was consensus among the experts that the optimal range of pupil size for recommending a presbyopia-correction IOL is a pupil diameter >2.8 mm under photopic conditions and <6.0 mm under scotopic conditions.

Overall, any abnormality which affects the cornea, retina, macula, or optic nerve might restrict the potential visual function after presbyopia-correcting IOL implantation. As discussed below, some conditions represent an absolute contraindication, while others are a relative contraindication. Experts reached a full or nearly complete consensus that the cornea, macula, retina, and optic nerve must be carefully examined preoperatively (Table 1A).

Comorbidities may preclude a good visual prognosis after presbyopia-correcting IOLs. Almost all experts agreed that in patients with age-related macular degeneration or a positive family history of the disease, the recommended IOL should be EDOF or a non-diffractive design (Table 2B). The experts broadly agreed that dry eye disease (DED) represents a relative contraindication (Table 2A). Tear abnormalities may lead to refractive surprise[31] and higher ocular discomfort after lens replacement surgery.[32] Dry eye disease is one of the leading causes of dissatisfaction after uneventful cataract surgeries, especially after multifocal IOL implantation.[33] The ASCRS Cataract Clinical Committee proposed that DED should be treated before lens-based surgery.[18] Experts broadly agreed that a lid malposition represents a relative contraindication that should be treated before implanting a presbyopia-correcting IOL.

Although a consensus was not reached, most experts considered that anisometropia and myopia >6.0 D do not represent a contraindication. The experts agreed that hyper-

TABLE 6. Which of the Following Intraoperative Complications Represent an Absolute or Relative Contraindication for Implanting a Presbyopia-Correcting Intraocular Lens?

	Absolute Contraindication	Relative Contraindication	No Contraindication	Uncertain	% Consensus	AGREEMENT
85. Corneal damage	0/10 (0%)	10/10 (100%)	0/10 (0%)	0/10 (0%)	100	YES
86. Iris damage	0/10 (0%)	8/10 (80%)	2/10 (20%)	0/10 (0%)	80	YES
87. Anterior capsule tear	0/10 (0%)	8/10 (80%)	2/10 (20%)	0/10 (0%)	80	YES
88. Posterior capsule tear	2/10 (20%)	8/10 (80%)	0/10 (0%)	0/10 (0%)	80	YES
89. Zonulolysis	4/10 (40%)	6/10 (60%)	0/10 (0%)	0/10 (0%)	60*	NO
90. Rhexis bigger than the optic plate	0/10 (0%)	7/10 (70%)	3/10 (30%)	0/10 (0%)	70	YES
91. Capsule fibrosis	0/10 (0%)	7/10 (70%)	3/10 (30%)	0/10 (0%)	70	YES
92. Anterior vitrectomy	1/10 (10%)	9/10 (90%)	0/10 (0%)	0/10 (0%)	90	YES

*≥70% considered as a contraindication (relative or absolute).

TABLE 7A. How Important Are the Following Issues in Optimizing the Clinical Outcomes and Minimizing Postoperative Complications After Presbyopia-Correcting Intraocular Lens Implantation?

	Median	% Consensus	Agreement
93. Timing of postoperative follow-up visit	6.5	50%	Agreement in the third round
94. Timing of postoperative follow-up test	7.0	70%	YES
95. Postoperative follow-up treatment	7.0	70%	YES
96. Postoperative surgical treatment	7.5	70%	YES
97. Time of surgery in the fellow eye	9.0	90%	YES

TABLE 7B. (Third-Round Questions). Do You Agree With the Following Postoperative Follow-Up Plan?

Statement	Yes (%)	No (%)	Uncertain	Agreement
1 day; 2 weeks (OCT/IOP/tear assessment and explain neuroadaptation process); 6 weeks if needed **(Item 93).**	7/10 (70%)	3/10 (70%)	0/10 (0%)	YES

Abbreviations: IOP = intraocular pressure; OCT = optical coherence tomography.

opia >4.0 D does not constitute a contraindication. Of note, although high ametropia itself should not be considered a contraindication, it is important to consider the potential limitations concerning short and long eyes previously pointed out to manage these patients carefully. Experts agreed that regular astigmatism >5.0 D represents a relative contraindication. It should be considered that the optical performance of multifocal toric IOLs with cylinder >3.00 D may significantly worsen with a small amount of IOL rotation (>5°).[34] A potential approach for high astigmatism patients is a bioptic procedure.

Increased corneal higher order aberrations (HOAs) worsen visual quality and reduce the chances of a satisfactory visual outcome from multifocal IOL implantation. The experts agreed to establish a threshold value of root mean square of HOAs and spherical aberration at which presbyopia-correcting IOL should not be recommended (Table 2B). Likewise, a broad consensus was reached on considering keratoconus as an absolute contraindication to any presbyopia-correcting IOL. Experts agreed that previous refractive corneal surgery represents a relative contraindication, depending on corneal HOAs, as stated above. Biometry may be less accurate in patients undergoing previous corneal refractive surgery,[35,36] and appropriately modified biometry formulae should be used.

There was a broad consensus that limbal stem cell deficiency, corneal epithelium and endothelium dysfunction, diabetic retinopathy, and dry and wet age-related macular degeneration are absolute contraindications for presbyopia-correcting IOL (Table 2). Likewise, the survey also revealed that a good consensus was reached among the experts that poor dilatation, iris defect, and synechiae represent relative contraindications. Experts agreed that previous uveitis, squint or previous squint surgery, epiretinal membrane, previous ocular surgery, macular drusen, and a peripheral rhegmatogenous retinal degeneration

TABLE 8. How Important is it to Carry Out the Following Tests Postoperatively to Prevent Future Complications After Presbyopia-Correcting Intraocular Lens Implantation?

	Median	% Consensus	Agreement
98. Keratometry	6.0	40%	NO
99. Optical coherence tomography macula	9.5	90%	YES
100. Corneal topography	8.0	90%	YES
101. Corneal tomography	8.0	70%	YES
102. Aberrometer	8.0	60%	NO
103. Intraocular pressure	8.5	80%	YES
104. Endothelial cell count	8.0	70%	YES
105. Defocus curve	6.5	50%	NO

represent a contraindication; however, there was no agreement on the level (absolute or relative). For patients with zonulopathy or an unstable capsular bag (pseudoexfoliation syndrome, trauma, high myopia), all experts agreed that the indication should be a monofocal or non-diffractive IOL design (Table 2B). For squint patients, there was a consensus among experts that presbyopia-correction IOLs only should be recommended, and with caution, if the stereopsis is good (Table 2B). In patients with rhegmatogenous retinal degeneration, a broad consensus was reached that a second opinion by a retinal specialist should be acquired, applying treatment if needed and delaying surgery if indicated (Table 2B). Finally, in patients with macular drusen, there was clear consensus that a DUET procedure should be considered or that IOL selection should be from EDOF or non-diffractive IOL designs (Table 2B). The experts disagreed as to whether floppy iris syndrome and diabetes without retinopathy represent a contraindication.

Regarding preoperative tests for preventing postoperative complications, out of the 17 tests proposed, experts agreed on seven (corneal topography and tomography, pupillometry static, biometry and biometry formula, optical coherence tomography (OCT) for retinal nerve fiber layer and macula assessment) (Table 2A). The results of this survey show that it is important to evaluate the cornea, macula, optic nerve, and pupil size to assess the appropriateness of a presbyopia-correcting IOL. Furthermore, IOL power calculation (biometric measurement and formula) must be as accurate as possible to obtain the best refractive outcomes. Related to this, the ASCRS Refractive-Cataract Surgery Subcommittee published a helpful article detailing the different available technologies for preoperative biometric measurements.[37] Interestingly, although there was consensus that DED represents a relative contraindication, experts did not reach an agreement on two tests proposed (Schirmer test and tear osmolarity) for routine diagnosis. The ASCRS Corneal Clinical Committee developed a consensus-based practical diagnostic ocular surface disease algorithm to provide surgeons with a way to efficiently diagnose and treat visually significant ocular surface disease before surgery.[38]

Once the surgeon ascertains that the patient is suitable for a presbyopia-correcting IOL after the preoperative examination, the next step is to decide the type of IOL that best suits the patient's profile. Independent of the IOL chosen, the power calculation is crucial to obtain optimal visual and refractive outcomes. The experts reached a complete consensus that the IOL power should be calculated with modern formulas (Table 4B). Regarding the IOL design, there are three important aspects: material, platform, and optic design. Almost all experts agreed that the IOL material for diffractive IOLs should be hydrophobic or hydrophilic with a hydrophobic surface and that a diffractive design is not mandatory for a presbyopia-correcting IOL (Table 4B). However, there was a significant discrepancy among experts on the important parameters for choosing the IOL characteristics (material, platform, and optic design), where there was only a consensus on the importance of the patient's habit for the optic design selection (Table 4A). This lack of agreement reveals the challenge of finding the IOL that best suits the patient's profile. Consequently, this is one of the main challenges that clinicians, researchers, and the industry should tackle soon. Within multifocal IOLs (only diffractive-based design), the surgeon may choose between a bifocal or trifocal IOL, different light distribution between foci and add powers.[3] In the EDOF IOLs family, diffractive and non-diffractive designs are available[5]; however, each IOL is usually implemented in a specific platform regarding material, IOL diameter, and haptics. Nevertheless, the platform could affect the performance of the optical design (e.g., material deterioration over time, posterior capsule opacification, probability of tilt or displacement due to haptics, or inadequate IOL diameter in relation to the capsular bag size). It is also worthy of note that some intraoperative aspects may also influence the performance of any IOL (e.g., the size and centration of the capsulorrhexis).[18,39] In order to find the best IOL for each patient's profile, perhaps an advance would be for each specific optic design to be available on different platforms (haptic, IOL diameter). Furthermore, it is interesting to note that the current nomenclature describing the different IOLs belonging to the family of presbyopia-correcting

IOLs is broad and without a clear consensus. Hence, it will be of great help to work towards using terminology and IOL classification that achieves a broad consensus within the Ophthalmological community.

Regarding the final areas under consideration—intraoperative and postoperative management—the experts agreed that corneal incision, the type of ophthalmic viscosurgical device used, and capsulorhexis are important surgical issues that should be considered in order to optimize the outcomes of the presbyopia-correcting IOL implantation (Table 5). Likewise, there was a full or nearly complete consensus that the eight proposed intraoperative complications represent relative or absolute contraindications for carrying on with the implantation of a presbyopia-correcting IOL. Regarding postoperative management, the survey shows a good agreement among experts on the importance of postoperative timing and the tests used for postoperative evaluation (Table 7A and 8), evidencing that appropriate postoperative follow-up is crucial to identify and manage unhappy patients. Like the agreement reached by the experts in this survey, the ASCRS Cataract Clinical Committee recommended that postoperative clinical evaluation should include corneal topography, intraocular pressure measurement, and a dilated funduscopic examination, with OCT if CDVA is worse than 20/20.[18] Furthermore, this Committee proposed a self-questionnaire to be answered by the surgeon to identify the potential sources of the patient's dissatisfaction. Surgeons must be familiar with the different medical and surgical options (laser touch-up, IOL exchange) to solve postoperative complications or patients' complaints. Otherwise, they should refer to a colleague who is familiar with refractive and complex case management. It is worthy of note that although most clinical studies evaluated the defocus curve in the battery of postoperative measurements, experts disagreed on the utility of this test for postoperative evaluation. The ASCRS Cataract Clinical Committee also did not include this test for postoperative assessment. Defocus curve may be a valuable tool to differentiate the performance of presbyopia-correcting IOLs[40]; however, it is time-consuming and impractical in routine clinical care.

Although the Delphi method is a robust procedure and has been widely used in different health fields, among them ophthalmology, it has limitations. Firstly, the Delphi method is not "evidence-based." In areas with little scientific literature or controversial findings, the consensus or lack of it will depend only on personal experience, which could affect the method's reproducibility. Lack of clear guidance on the selection of the experts and the required sample size are recognized limitations of the Delphi method.[41] The expert panel comprised experts from different countries, and the number of recruited experts (n = 10) was consistent with the recommendations that advise five to ten experts per professional group.[17] However, the relatively small number of experts did help to achieve a 100% response rate in all rounds.

In conclusion, this study using the Delphi method found a broad agreement on the key preoperative recommendations to assess the patient's suitability for presbyopia-correcting IOLs. Likewise, experts agreed on multiple relevant aspects of the intraoperative and postoperative management of patients who undergo presbyopia-correcting IOLs implantation. Finally, a lack of consensus was found in issues related to the IOL selection.

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REFERENCES

1. Vargas V, Radner W, Allan BD. Methods for the study of near, intermediate vision, and accommodation: an overview of subjective and objective approaches. *Surv Ophthalmol*. 2019;64:90–100.
2. Schallhorn JM. Multifocal and extended depth of focus intraocular lenses: A comparison of data from the United States Food and Drug Administration premarket approval trials. *J Refract Surg*. 2021;37:98–104.
3. Rampat R, Gatinel D. Multifocal and extended depth-of-focus intraocular lenses in 2020. *Ophthalmology*. 2021;128:e164–e185.
4. Yeu E, Cuozzo S. Matching the patient to the intraocular lens: Preoperative considerations to optimize surgical outcomes. *Ophthalmology*. 2021;128:e132–e141.
5. Kohnen T, Suryakumar R. Extended depth-of-focus technology in intraocular lenses. *J Cataract Refract Surg*. 2020;46:298–304.
6. Jones J, Hunter D. Consensus methods for medical and health services research. *BMJ*. 1995;311:376–380.
7. Behrens A, Doyle JJ, Stern L, et al. Dysfunctional tear syndrome: a Delphi approach to treatment recommendations. *Cornea*. 2006;25:900–907.
8. Ferris 3rd FL, Wilkinson CP, Bird A, et al. Clinical classification of age-related macular degeneration. *Ophthalmology*. 2013;120:844–851.

9. Gomes JA, Tan D, Rapuano CJ, et al. Global consensus on keratoconus and ectatic diseases. *Cornea*. 2015;34:359–369.
10. Sii S, Barton K, Pasquale LR, et al. Reporting harm in glaucoma surgical trials: Systematic review and a consensus-derived new classification system. *Am J Ophthalmol*. 2018;194:153–162.
11. Thein AS, Hedengran A, Azuara-Blanco A, et al. Adverse effects and safety in glaucoma patients: Agreement on Clinical Trial Outcomes for Reports on Eye Drops (ASGARD)-A Delphi consensus statement. *Am J Ophthalmol*. 2022;241:190–197.
12. Giovannini A, Parravano M, Ricci F, Bandello F. Management of diabetic macular edema with intravitreal dexamethasone implants: Expert recommendations using a Delphi-based approach. *Eur J Ophthalmol*. 2019;29:82–91.
13. García Layana A, Adán A, Ascaso FJ, et al. Use of intravitreal dexamethasone implants in the treatment of diabetic macular edema: Expert recommendations using a Delphi approach. *Eur J Ophthalmol*. 2020;30:1042–1052.
14. Aptel F, Colin C, Kaderli S, et al. Management of postoperative inflammation after cataract and complex ocular surgeries: a systematic review and Delphi survey. *Br J Ophthalmol*. 2017;101:1–10.
15. Labetoulle M, Bourcier T, Doan S, et al. Classifying signs and symptoms of dry eye disease according to underlying mechanism via the Delphi method: the DIDACTIC study. *Br J Ophthalmol*. 2019;103:1475–1480.
16. Bandello F, Midena E, Menchini U, Lanzetta P. Recommendations for the appropriate management of diabetic macular edema: Light on DME survey and consensus document by an expert panel. *Eur J Ophthalmol*. 2016;26:252–261.
17. Poleon S, Racette L, Fifolt M, et al. Patient and provider perspectives on glaucoma treatment adherence: A Delphi study in urban Alabama. *Optom Vis Sci*. 2021;98:1085–1093.
18. Braga-Mele R, Chang D, Dewey S, et al. Multifocal intraocular lenses: relative indications and contraindications for implantation. *J Cataract Refract Surg*. 2014;40:313–322.
19. Liu JW, Haw WW. Optimizing outcomes of multifocal intraocular lenses. *Curr Opin Ophthalmol*. 2014;25:44–48.
20. Alio JL, Plaza-Puche AB, Férnandez-Buenaga R, Pikkel J, Maldonado M. Multifocal intraocular lenses: An overview. *Surv Ophthalmol*. 2017;6:611–634.
21. Oshika T, Bissen-Miyajima H, Nonaka T. Comparison of preoperative chair time between monofocal and multifocal intraocular lenses. *J Cataract Refract Surg*. 2022;48:632–633.
22. Fernández-Vega L, Alfonso JF, Baamonde B, et al. Visual and refractive outcomes in hyperopic pseudophakic patients implanted with the Acri.LISA 366D multifocal intraocular lens. *Am J Ophthalmol*. 2009;148 214-220.e1.
23. Alfonso JF, Fernández-Vega L, Ortí S, Ferrer-Blasco T, Montés-Micó R. Refractive and visual results after implantation of the AcrySof ReSTOR IOL in high and low hyperopic eyes. *Eur J Ophthalmol*. 2009;19:748–753.
24. Takabatake R, Takahashi M. Preoperative factors affecting visual acuity following the implantation of diffractive multifocal intraocular lenses. *J Refract Surg*. 2021;37:674–679.
25. Kane JX, Van Herdeen A, Atik A, Petsoglou C. Intraocular lens power formula accuracy: comparison of 7 formulas. *J Cataract Refract Surg*. 2016;42:1490–1500.
26. Steinwender G, Schwarz L, Böhm M, et al. Visual results after implantation of a trifocal intraocular lens in high myopes. *J Cataract Refract Surg*. 2018;44:680–685.
27. Alfonso-Bartolozzi B, Villota E, Fernández-Vega-González Á, et al. Implantation of a trifocal intraocular lens in high myopic eyes with nasal-inferior staphyloma. *Clin Ophthalmol*. 2020;14:721–727.
28. de Vries NE, Webers CAB, Touwslager WRH, et al. Dissatisfaction after implantation of multifocal intraocular lenses. *J Cataract Refract Surg*. 2011;37:859–865.
29. Al-Hashimi S, Donaldson K, Davidson R, et al. Medical and surgical management of the small pupil during cataract surgery. *J Cataract Refract Surg*. 2018;44:1032–1041.
30. Fernández-Vega-Cueto L, Madrid-Costa D, Alfonso-Bartolozzi B, et al. Optical and clinical outcomes of an extended range of vision intraocular lens. *J Refract Surg*. 2022;38:168–176.
31. Epitropoulos AT, Matossian C, Berdy GJ, et al. Effect of tear osmolarity on repeatability of keratometry for cataract surgery planning. *J Cataract Refract Surg*. 2015;41:1672e1677.
32. González-Mesa A, Moreno-Arrones JP, Ferrari D, Teus MA. Role of tear osmolarity in dry eye symptoms after cataract surgery. *Am J Ophthalmol*. 2016;170:128–132.
33. Woodward MA, Randleman JB, Stulting RD. Dissatisfaction after multifocal intraocular lens implantation. *J Cataract Refract Surg*. 2009;35:992–997.
34. Ruiz-Alcocer J, Lorente-Velázquez A, de Gracia P, Madrid–Costa D. Optical tolerance to rotation of trifocal toric intraocular lenses as a function of the cylinder power. *Eur J Ophthalmol*. 2021;31:1007–1013.
35. Wang L, Koch DD. Intraocular lens power calculations in eyes with previous corneal refractive surgery: review and expert opinion. *Ophthalmology*. 2021;128:e121–e131.
36. Pantanelli SM, Lin CC, Al-Mohtaseb Z, et al. Intraocular lens power calculation in eyes with previous excimer laser surgery for myopia: A report by the American Academy of Ophthalmology. *Ophthalmology*. 2021;128:781–792.
37. Donaldson K, Fernández-Vega-Cueto L, Davidson R, et al. Perioperative assessment for refractive cataract surgery. *J Cataract Refract Surg*. 2018;44:642–653.
38. Starr CE, Gupta PK, Farid M, et al. An algorithm for the preoperative diagnosis and treatment of ocular surface disorders. *J Cataract Refract Surg*. 2019;45:669–684.
39. Rossi T, Ceccacci A, Testa G, et al. Influence of anterior capsulorhexis shape, centration, size, and location on intraocular lens position: finite element model. *J Cataract Refract Surg*. 2022;48:222–229.
40. Kohnen T, Lemp-Hull J, Suryakumar R. Defocus curves: focusing on factors influencing assessment. *J Cataract Refract Surg*. 2022;48:961–968.
41. Gillies K, Skea ZC, Maclennan SJ, et al. Determining information for inclusion in a decision-support intervention for clinical trial participation: a modified Delphi approach. *Clin Trials*. 2013;10:967–976.