Rate of Complete Spectacle Independence with a Trifocal IOL: A Systematic Literature Review and Meta-Analysis

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BACKGROUND

- In 2019, the U.S. Food & Drug Administration approved the first trifocal IOL AcrySof® IQ PanOptix® (TFNTXX/TFATXX) for the correction of presbyopia
- Many prospective and retrospective studies across the world have reported spectacle independence with PanOptix implantation
- The question remains however, as to what the pooled data of PanOptix spectacle independence shows among this literature

OBJECTIVE

The objective of this study was to identify and pool published evidence on the spectacle independence (SI) rates in patients with bilateral implantation of TFNTXX/TFATXX trifocal IOL

METHODS

Literature Review

- PubMed database was searched from January 1, 2017 to September 27, 2021 and supplemented by searching Congress abstract databases (ASCRS, APACRS, ESCRS, AAO, APAO)
- Search terms included PanOptix, TFNTXX, TFATXX, spectacle independence, visual outcomes
- Randomized and observational clinical studies reporting follow-up of 1 or more months were included for analysis
- Articles with the outcome of interest (spectacle independence, SI) were identified and information was collected in a data extraction form (DEF)

Meta-Analysis

A Bayesian random effects meta-analysis was conducted, providing a pooled estimate of SI (posterior median treatment effect and its 95% credible interval (CI)) for the following endpoints and patient populations listed in **Table 1**.

Table 1: Analyses performed to determine SI rate in patients implanted with TFNTXX/TFATXX

	Base Case Analysis	Subgroup Analysis	Scenario Analysis
Endpoint	Complete spectacle independence	Spectacle independence for far, intermediate and near distances	Complete spectacle independence
Patient population	Patients who underwent cataract surgery or refractive lens exchange (RLE)	Patients who underwent cataract surgery or refractive lens exchange (RLE)	Patients who underwent cataract surgery only

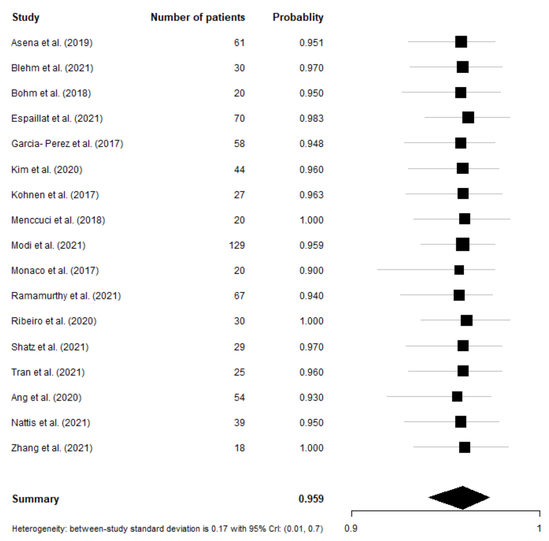
RESULTS

- 26 clinical or observational studies were included
  - 20 peer-reviewed publications, 6 congress presentations
  - 24 prospective, 2 retrospective
  - 16+ different countries

2. Subgroup Analysis

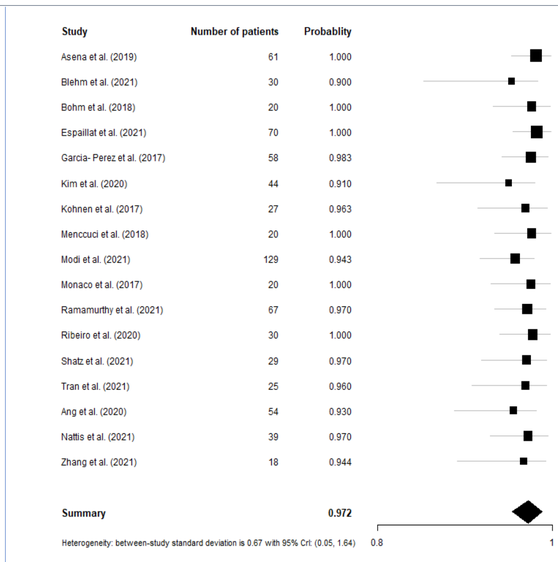
SI for far, intermediate, and near distances in patients who underwent cataract or RLE surgery

SI (far)



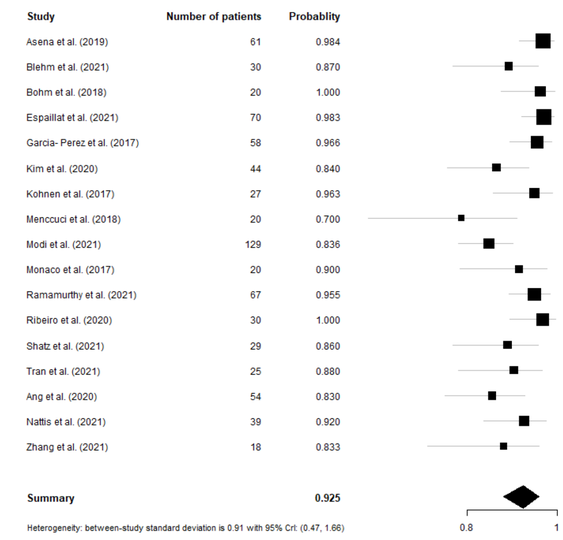
- N=17 studies (741 patients)
- **SI (far)=95.9%** (94.1%, 97.3%)

SI (intermediate)



- N=17 studies (741 patients)
- **SI (intermediate)=97.2%** (95.4%, 98.8%)

SI (near)

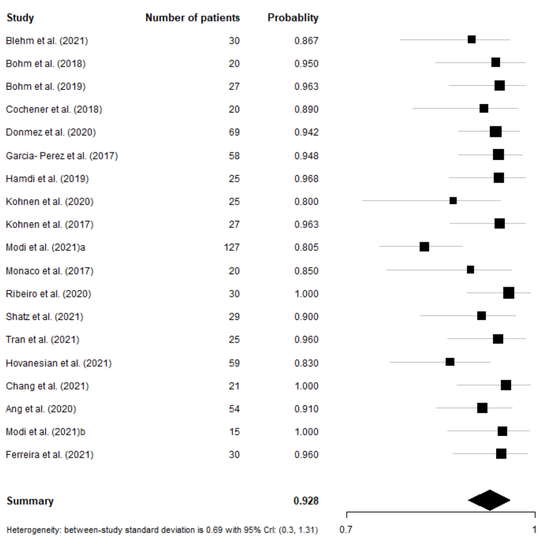


- N=17 studies (741 patients)
- **SI (near)=92.5%** (88.1%, 95.9%)

1. Base Case Analysis

Complete SI rate in patients who underwent cataract or RLE surgery

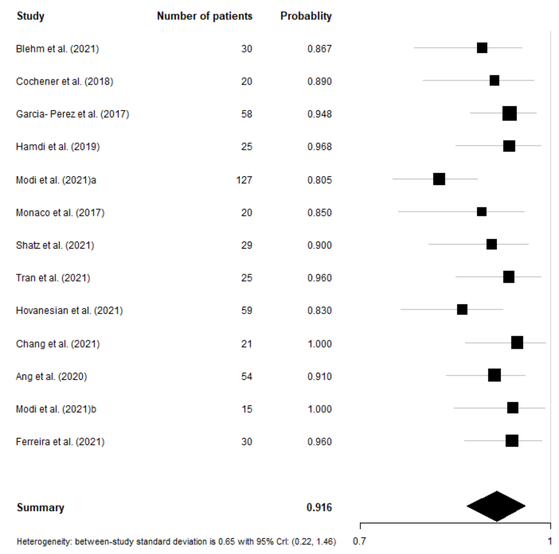
- Includes 19 studies (711 patients)
- **The complete SI rate in patients who underwent cataract or RLE surgery with TFNTXX/TFATXX IOL was 92.8%,** with 95% CrI 89.3% to 95.9%



3. Scenario Analysis

Complete SI rate in patients who underwent cataract surgery only

- Includes 13 studies (513 patients)
- **The complete SI rate in patients who underwent cataract surgery with TFNTXX/TFATXX IOL was 91.6%,** with 95% CrI 86.8% to 95.9%



DISCUSSION AND CONCLUSION

- This meta-analysis demonstrates at least 9 out of 10 patients receiving TFNTXX/TFATXX IOL for cataract or RLE surgery can be expected to achieve complete spectacle independence
- Subgroup analyses also show 9 out of 10 patients receiving TFNTXX/TFATXX IOL can achieve spectacle independence for far, intermediate and near distances
- Spectacle independence was highest for intermediate vision (cataract and RLE population) – 97.2%
- This study provides informative data for clinicians and patients to feel confident in the use of PanOptix as a trifocal IOL with high rates of spectacle independence

REFERENCES

1. Sackett et al. *BMJ* 1996;312:71–2. 2. Lasserson et al. *Cochrane* 2022. Available from www.training.cochrane.org/handbook. 3. Murad et al. *BMJ* 2016;21:125-7. 4. Sutton et al. Statistical methods in medical research 2001;10: 277-303. 5. Espaillat et al. *Clin Ophthalmol* 2021;15:495-503. 6. Kim et al. *BMC Ophthalmol* 2020;20:288. 7. Blehm et al. *Clin Ophthalmol* 2021;15:2907-12. 8. Cochener et al. *J of Refract Surg* 2018;34:507-14. 9. García-Pérez et al. *BMC Ophthalmol* 2017;17:72. 10. Hamdi et al. *Clin Ophthalmol* 2019;13:1955-61. 11. Modi et al. *Ophthalmol* 2021;128:197-207. 12. Monaco et al. *J Cataract Refract Surg* 2017;43:737-47. 13. Ramamurthy et al. *Clin Ophthalmol* 2021;15:213-225. 14. Tran et al. *Clin Ophthalmol*. 2021;15:403-12. 15. Hovanesian et al. *Clin Ophthalmol* 2021;15:983-90. 16. Ang et al. ESCRS 2020; Dublin, Ireland. 17. Chang et al. ASCRS 2021; Las Vegas, Nevada. 18. Ferreira et al. ESCRS 2021; Amsterdam, Netherlands. 19. Modi et al. ASCRS 2021; Las Vegas, Nevada. 20. Nattis et al. ASCRS 2021; Las Vegas, Nevada. 21. Zhang et al. APAO 2021; virtual. 22. Mencucci et al. Clin Exp Ophthalmol 2018;256:1913-22. 23. Asena et al. *J Cataract Refract Surg* 2019;45):1539-46. 24. Böhm et al. *J Cataract Refract Surg* 2018;44:1454-62. 25. Böhm et al. *J Cataract Refract Surg* 2019;45:1625-36. 26. Donmez et al. International Ophthalmol 2020;40:1069-75. 27. Kohnen et al. *J Refract Surg* 2020;36:638-644. 28. Kohnen et al. *Am J Ophthalmol.* 2017;184:52-62. 29. Shatz et al. *Clinical Ophthalmol.* 2021;15:2545. 30. Ribeiro et al. *J Cataract Refract Surg* 2020;46:694-9.

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