

ZEISS SITA Faster and 24-2C

Visual field testing strategies and protocols



Compendium of peer-reviewed journal articles
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Seeing beyond

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SITA Faster Design, Validation and Clinical Comparisons

1. Heijl A, Patella VM, Chong LX, et al. **A New SITA Perimetric Threshold Testing Algorithm: Construction and a Multicenter Clinical Study.** *Am J Ophthalmol.* Feb 2019;198:154-165. doi:10.1016/j.ajo.2018.10.010.
<https://www.ncbi.nlm.nih.gov/pubmed/30336129>; [https://www.ajo.com/article/S0002-9394\(18\)30592-0/fulltext](https://www.ajo.com/article/S0002-9394(18)30592-0/fulltext)
2. Phu J, Khuu SK, Agar A, Kalloniatis M. **Clinical Evaluation of Swedish Interactive Thresholding Algorithm-Faster Compared With Swedish Interactive Thresholding Algorithm-Standard in Normal Subjects, Glaucoma Suspects, and Patients With Glaucoma.** *Am J Ophthalmol.* Dec 2019;208:251-264. doi:10.1016/j.ajo.2019.08.013.
<https://www.ncbi.nlm.nih.gov/pubmed/31470001>
3. Lavanya R, Riyazuddin M, Dasari S, et al. **A Comparison of the Visual Field Parameters of SITA Faster and SITA Standard Strategies in Glaucoma.** *J Glaucoma.* Sep 2020;29(9):783 -788. doi:10.1097/IJG.0000000000001551.
<https://www.ncbi.nlm.nih.gov/pubmed/32459685>
4. Thulasidas M, Patyal S. **Comparison of 24-2 Faster, Fast, and Standard Programs of Swedish Interactive Threshold Algorithm of Humphrey Field Analyzer for Perimetry in Patients with Manifest and Suspect Glaucoma.** *J Glaucoma.* Nov 2020;29(11):1070-1076. doi:10.1097/IJG.0000000000001611. <https://www.ncbi.nlm.nih.gov/pubmed/32890104>;
<https://www.ingentaconnect.com/content/wk/jglau/2020/00000029/00000011/art00013>
5. Qian CX, Chen Q, Cun Q, et al. **Comparison of the SITA Faster – A New Visual Field Strategy With SITA Fast Strategy.** *Int J Ophthalmol.* 2021;14(8):1185-1191. doi:10.18240/ijo.2021.08.08. <https://www.ncbi.nlm.nih.gov/pubmed/34414082>
6. Phu J, Kalloniatis M. **A Strategy for Seeding Point Error Assessment for Retesting (SPEAR) in Perimetry Applied to Normal Subjects, Glaucoma Suspects, and Patients with Glaucoma.** *Am J Ophthalmol.* Jan 2021;221:115-130. doi:10.1016/j.ajo.2020.07.047. <https://www.ncbi.nlm.nih.gov/pubmed/32777379>
7. Prager AJ, Kang JM, Tanna AP. **Advances in Perimetry for Glaucoma.** *Curr Opin Ophthalmol.* Mar 1 2021;32(2):92-97. doi:10.1097/ICU.0000000000000735. <https://www.ncbi.nlm.nih.gov/pubmed/33443958>
8. Mendieta N, Suarez J, Blasco C, Muniz R, Pueyo C. **A Comparative Study between Swedish Interactive Thresholding Algorithm Faster and Swedish Interactive Thresholding Algorithm Standard in Glaucoma Patients.** *J Curr Ophthalmol.* Jul-Sep 2021;33(3):247-252. doi:10.4103/joco.joco_148_20. <https://www.ncbi.nlm.nih.gov/pubmed/34765810>
9. Pham AT, Ramulu PY, Boland MV, Yohannan J. **The Effect of Transitioning from SITA Standard to SITA Faster on Visual Field Performance.** *Ophthalmology.* Oct 2021;128(10):1417-1425. doi:10.1016/j.ophtha.2021.03.032.
<https://www.ncbi.nlm.nih.gov/pubmed/33798655>
10. Thulasidas M, Patyal S. Re: Pham et al. **The effect of transitioning from SITA standard to SITA faster on visual field performance** (*Ophthalmology.* 2021;128;1417-1425). *Ophthalmology.* Nov 2021;128(11):e215-e216. doi:10.1016/j.ophtha.2021.07.021. <https://www.ncbi.nlm.nih.gov/pubmed/34380596>
11. Phu J, Kalloniatis M. **Patient and technician perspectives following the introduction of frontloaded visual field testing in glaucoma assessment.** *Clin Exp Optom.* Aug 2022;105(6):617-623. doi:10.1080/08164622.2021.1965461.
<https://www.ncbi.nlm.nih.gov/pubmed/34402753>
12. Rodriguez-Agirretxe I, Loizate E, Astorkiza B, Onaindia A, Galdos-Olasagasti L, Basasoro A. **Validation of the SITA faster strategy for the management of glaucoma.** *Int Ophthalmol.* Aug 2022;42(8):2347-2354. doi:10.1007/s10792-022-02232-6.
<https://www.ncbi.nlm.nih.gov/pubmed/35072855>; <https://link.springer.com/article/10.1007/s10792-022-02232-6>
13. Lee GA, Kong GYX, Liu CH. **Visual fields in glaucoma: Where are we now?** *Clin Exp Ophthalmol.* Mar 2023;51(2):162-169. doi:10.1111/ceo.14210. <https://www.ncbi.nlm.nih.gov/pubmed/36751125>

SITA Faster Reliability Metrics

1. Anderson G, Graves N. **Effects of response style on SITA Standard 24-2C and SITA Faster 24-2C visual field tests.** *Invest Ophthalmol Vis Sci.* 2020;61(7):3885-3885. <https://iovs.arvojournals.org/article.aspx?articleid=2768291>
2. Phu J, Kalloniatis M. **The Frontloading Fields Study (FFS): Detecting Changes in Mean Deviation in Glaucoma Using Multiple Visual Field Tests Per Clinical Visit.** *Transl Vis Sci Technol.* Nov 1 2021;10(13):21. doi:10.1167/tvst.10.13.21. <https://www.ncbi.nlm.nih.gov/pubmed/34779836>
3. Heijl A, Patella VM, Flanagan JG, et al. **False Positive Responses in Standard Automated Perimetry.** *Am J Ophthalmol.* Jan 2022;233:180-188. doi:10.1016/j.ajo.2021.06.026. <https://www.ncbi.nlm.nih.gov/pubmed/34283973>
4. Camp AS, Long CP, Patella VM, Proudfoot JA, Weinreb RN. **Standard Reliability and Gaze Tracking Metrics in Glaucoma and Glaucoma Suspects.** *Am J Ophthalmol.* Feb 2022;234:91-98. doi:10.1016/j.ajo.2021.06.038. <https://www.ncbi.nlm.nih.gov/pubmed/34280366>
5. Phu J, Kalloniatis M. **The Frontloading Fields Study: The Impact of False Positives and Seeding Point Errors on Visual Field Reliability When Using SITA-Faster.** *Transl Vis Sci Technol.* Feb 1 2022;11(2):20. doi:10.1167/tvst.11.2.20 <https://www.ncbi.nlm.nih.gov/pubmed/35142783>
6. Phu J, Kalloniatis M. **Gaze tracker parameters have little association with visual field metrics of intrasession frontloaded SITA-Faster 24-2 visual field results.** *Ophthalmic Physiol Opt.* Sep 2022;42(5):973-985. doi:10.1111/opo.13006. <https://www.ncbi.nlm.nih.gov/pubmed/35598152>
7. Costa VP, Zangalli CS, Jammal AA, et al. **24-2 SITA Standard versus 24-2 SITA Faster in Perimetry-Naive Normal Subjects.** *Ophthalmol Glaucoma.* Mar-Apr 2023;6(2):129-136. doi:10.1016/j.ogla.2022.08.006. <https://www.ncbi.nlm.nih.gov/pubmed/35985477>; <https://www.sciencedirect.com/science/article/abs/pii/S2589419622001569?via%3Dihub>
8. Tan JCK, Kalloniatis M, Phu J. **Frontloading SITA-Faster Can Increase Frequency and Reliability of Visual Field Testing at Minimal Time Cost.** *Ophthalmol Glaucoma.* Sep-Oct 2023;6(5):445-456. doi:10.1016/j.ogla.2023.03.006. <https://www.ncbi.nlm.nih.gov/pubmed/36958625>; <https://www.sciencedirect.com/science/article/abs/pii/S2589419623000649?via%3Dihub>
9. Tan JCK, Agar A, Kalloniatis M, Phu J. **Quantification and Predictors of Visual Field Variability in Healthy, Glaucoma Suspect, and Glaucomatous Eyes Using SITA-Faster.** *Ophthalmology.* Jun 2024;131(6):658-666. doi:10.1016/j.ophtha.2023.12.018. <https://www.ncbi.nlm.nih.gov/pubmed/38110124>; [https://www.aaojournal.org/article/S0161-6420\(23\)00909-0/abstract](https://www.aaojournal.org/article/S0161-6420(23)00909-0/abstract)

24-2C Test Pattern – Applications and Clinical Comparisons

1. Lee GC, Monhart M, Callan T, et al. **Performance of a modified 24-2 test pattern using SITA Faster.** *Invest Ophthalmol Vis Sci.* 2018;59(9):6032-6032. <https://iovs.arvojournals.org/article.aspx?articleid=2693900>
2. Lee GC, Yu S, Callan T, Durbin MK, Covita A, Severin T. **Diagnostic Efficacy of 24-2 and 24-2C SITA Faster Global Summary Indices.** *Invest Ophthalmol Vis Sci.* 2019;60(9):2455-2455. <https://iovs.arvojournals.org/article.aspx?articleid=2746216>
3. Callan T, Lee GC, Yu S, et al. **Evaluation of the SITA Standard 24-2C visual field test.** *Invest Ophthalmol Vis Sci.* 2020;61(7):3876-3876. <https://iovs.arvojournals.org/article.aspx?articleid=2769130>
4. Lee GC, Callan T, Yu S, et al. **Comparison of 24-2C SITA Standard test times to legacy SITA tests.** *Invest Ophthalmol Vis Sci.* 2020;61(7):3879-3879. <https://iovs.arvojournals.org/article.aspx?articleid=2769355>

24-2C Test Pattern – Applications and Clinical Comparisons (continued)

5. Chakravarti T, Moghadam M, Proudfoot JA, Weinreb RN, Bowd C, Zangwill LM. **Agreement Between 10-2 and 24-2C Visual Field Test Protocols for Detecting Glaucomatous Central Visual Field Defects.** *J Glaucoma*. Jun 1 2021;30(6):e285-e291. doi:10.1097/IJG.0000000000001844. <https://www.ncbi.nlm.nih.gov/pubmed/33813563>
6. Carpenter A, Callan T, Yu S, et al. **Diagnostic efficacy of 24-2C SITA Standard global summary indices.** *Invest Ophthalmol Vis Sci*. 2022;63(7):1264 – A0404-1264 – A0404. <https://iovs.arvojournals.org/article.aspx?articleid=2782783>
7. Harrison L, Chen A, Chen PP, Luong P. **Pointwise Comparison of the 24-2C and 10-2 for Central Field Defects.** *Invest Ophthalmol Vis Sci*. 2022;63(7):1251 – A0391-1251 – A0391. <https://iovs.arvojournals.org/article.aspx?articleid=2782177>
8. Lee GC, Cunningham B, Chong L, et al. **Perimetric simulations of 24-2C SITA Standard visual fields.** *Invest Ophthalmol Vis Sci*. 2022;63(7):1255 – A0395-1255 – A0395. <https://iovs.arvojournals.org/article.aspx?articleid=2782363>
9. Su S, Callan T, Yu S, et al. **Comparison of 24-2C SITA Standard and 24-2C SITA Faster.** *Invest Ophthalmol Vis Sci*. 2022;63(7):1267 – A0407-1267 – A0407. <https://iovs.arvojournals.org/article.aspx?articleid=2783014>
10. Meshkin RS, Zhao Y, Elze T, Boland MV, Friedman DS. **Remote Video Monitoring of Simultaneous Visual Field Testing.** *J Glaucoma*. Jul 1 2022;31(7):488-493. doi:10.1097/IJG.0000000000002045. <https://www.ncbi.nlm.nih.gov/pubmed/35763679>; <https://www.ingentaconnect.com/content/wk/jglau/2022/00000031/00000007/art00004>
11. Trouilloud A, Ferry E, Boucart M, et al. **Impact of glaucoma on the spatial frequency processing of scenes in central vision.** *Vis Neurosci*. Feb 8 2023;40:E001. doi:10.1017/S0952523822000086. <https://www.ncbi.nlm.nih.gov/pubmed/36752177>
12. Behera G, Nath A, Ramasamy A, Kaliaperumal S. **Comparing Static Perimetry Protocols of Central Field Testing among Patients with Glaucoma.** *Optom Vis Sci*. Jun 1 2023;100(6):406-411. doi:10.1097/OPX.0000000000002020. <https://www.ncbi.nlm.nih.gov/pubmed/37129640>
13. Kha R, Macken O, Mitchell P, et al. **The Australian Eye and Ear Health Survey (AEEHS): Study protocol for a population-based cross-sectional study.** *PLoS One*. 2024;19(5):e0301846. doi:10.1371/journal.pone.0301846. <https://www.ncbi.nlm.nih.gov/pubmed/38820367>
14. Rianti N, Satari K, Prahasta A, Rifada RM, Umbara S. **Comparison of SITA Standard 24-2 with SITA Faster 24-2c Program on Humphrey Field Analyzer in Assessing Visual Field Defects of Glaucoma Patients.** *Ophthalmologica Indonesiana*. Feb 12 2024;49(S1):50-57. doi:10.35749/a4syph39. <https://doi.org/10.35749/a4syph39>; <https://ophthalmologica-indonesiana.com/index.php/journal/article/download/100929/403.pdf>
15. Nishijima E, Fukai K, Sano K, et al. **Comparative Analysis of 24-2C, 24-2, and 10-2 Visual Field Tests for Detecting Mild-Stage Glaucoma With Central Visual field Defects.** *Am J Ophthalmol*. Dec 2024;268:275-284. doi:10.1016/j.ajo.2024.07.024. <https://www.ncbi.nlm.nih.gov/pubmed/39094994>
16. Tan JCK, Yohannan J, Ramulu PY, et al. **Visual field testing in glaucoma using the Swedish Interactive Thresholding Algorithm (SITA).** *Surv Ophthalmol*. Jan-Feb 2025;70(1):141-152. doi:10.1016/j.survophthal.2024.09.005. <https://www.ncbi.nlm.nih.gov/pubmed/39349186>

Guided Progression Analysis (GPA™) with SITA Faster

1. Phu J, Kalloniatis M. **Viability of Performing Multiple 24-2 Visual Field Examinations at the Same Clinical Visit: The Frontloading Fields Study (FFS).** *Am J Ophthalmol.* Oct 2021;230:48-59. doi:10.1016/j.ajo.2021.04.019. <https://www.ncbi.nlm.nih.gov/pubmed/33951444>
2. Le CT, Fiksel J, Ramulu P, Yohannan J. **Differences in visual field loss pattern when transitioning from SITA standard to SITA faster.** *Sci Rep.* Apr 29 2022;12(1):7001. doi:10.1038/s41598-022-11044-8. <https://www.ncbi.nlm.nih.gov/pubmed/35488026>
3. Chen RI, Gedde SJ. **Assessment of visual field progression in glaucoma.** *Curr Opin Ophthalmol.* Mar 1 2023;34(2):103-108. doi:10.1097/ICU.0000000000000932. <https://www.ncbi.nlm.nih.gov/pubmed/36378107>; <https://www.ingentaconnect.com/content/wk/icu/2023/00000034/00000002/art00003>
4. Tan JCK, Phu J, Go D, et al. **Evaluation of the Consistency of Glaucomatous Visual Field Defects Using a Clustered SITA-Faster Protocol.** *Ophthalmology.* Nov 2023;130(11):1138-1148. doi:10.1016/j.ophtha.2023.06.018. <https://www.ncbi.nlm.nih.gov/pubmed/37385298>
5. Wang H, Kalloniatis M, Tan JCK, Phu J. **Frontloading visual field tests detect earlier mean deviation progression when applied to real-world-derived early-stage glaucoma data.** *Ophthalmic Physiol Opt.* Mar 2024;44(2):426-441. doi:10.1111/opo.13270. <https://www.ncbi.nlm.nih.gov/pubmed/38226742>
6. Phu J, Tan J, Kalloniatis M. **Multiple (frontloaded) visual field tests increase identification of very slow mean deviation progression in glaucoma.** *Can J Ophthalmol.* Oct 2024;59(5):311-323. doi:10.1016/j.jcjo.2023.07.023. <https://www.ncbi.nlm.nih.gov/pubmed/37652089>

Structure – Function Relationship

1. Chakravarti T, Moghadam M, OH WH, et al. **Agreement between structural and functional tests for detecting central glaucomatous defects.** *Invest Ophthalmol Vis Sci.* 2020;61(9):PB0098-PB0098. <https://iovs.arvojournals.org/article.aspx?articleid=2770475>
2. Kresch YS, Tsamis E, Liebmann JM, De Moraes CG, Hood DC. **A comparison of the 24-2, 24-2C and 10-2 test locations to the region of arcuate defects seen on OCT retinal ganglion cell probability maps.** *Invest Ophthalmol Vis Sci.* 2020;61(7):1975-1975. <https://iovs.arvojournals.org/article.aspx?articleid=2769699>
3. Phu J, Kalloniatis M. **Ability of 24-2C and 24-2 Grids to Identify Central Visual Field Defects and Structure-Function Concordance in Glaucoma and Suspects.** *Am J Ophthalmol.* Nov 2020;219:317-331doi:10.1016/j.ajo.2020.06.024. <https://www.ncbi.nlm.nih.gov/pubmed/32621896>
4. Phu J, Kalloniatis M. **Comparison of 10-2 and 24-2C Test Grids for Identifying Central Visual Field Defects in Glaucoma and Suspect Patients.** *Ophthalmology.* Oct 2021;128(10):1405-1416. doi:10.1016/j.ophtha.2021.03.014. <https://www.ncbi.nlm.nih.gov/pubmed/33722636>
5. Hong JW, Baek MS, Lee JY, Song MK, Shin JW, Kook MS. **Comparison of the 24-2 and 24-2C Visual Field Grids in Determining the Macular Structure-Function Relationship in Glaucoma.** *J Glaucoma.* Oct 1 2021;30(10):887-894. doi:10.1097/IJG.0000000000001928. <https://www.ncbi.nlm.nih.gov/pubmed/34387259>; <https://www.ingentaconnect.com/content/wk/jglau/2021/00000030/00000010/art00009>

6. Rafla D, Khuu SK, Kashyap S, Kalloniatis M, Phu J. **Visualising structural and functional characteristics distinguishing between newly diagnosed high-tension and low-tension glaucoma patients.** *Ophthalmic Physiol Opt.* 2023;43(4):771-787. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10946885/pdf/OPO-43-771.pdf>
7. Balas M, Mathew DJ. **Secondary open-angle glaucoma in a young male related to dimethylamylamine supplementation.** *Can J Ophthalmol.* Aug 2023;58(4):e171-e175. doi:10.1016/j.jcjo.2023.02.011. <https://www.ncbi.nlm.nih.gov/pubmed/36965509>
8. Rafla D, Kalloniatis M, Phu J. **The effect of macular visual field test density on central structure-function concordance in glaucoma.** *Clin Exp Optom.* Mar 14 2024;1-10. doi:10.1080/08164622.2024.2319767. <https://www.ncbi.nlm.nih.gov/pubmed/38484727>
9. Du KH, Kamalipour A, Moghimi S. **Central visual field in glaucoma: An updated review.** *Taiwan J Ophthalmol.* Jul-Sep 2024;14(3):360-370. doi:10.4103/tjo.TJO-D-24-00042. <https://www.ncbi.nlm.nih.gov/pubmed/39430344>
10. Tong J, Phu J, Alonso-Caneiro D, et al. **Exploring the relationship between 24-2 visual field and widefield optical coherence tomography data across healthy, glaucoma suspect and glaucoma eyes.** *Ophthalmic Physiol Opt.* Nov 2024;44(7):1484-1499. doi:10.1111/opo.13368. <https://www.ncbi.nlm.nih.gov/pubmed/39056571>

Neuro-Ophthalmology and Other Non-Glaucoma Applications

1. Yamane MLM, Odel JG. **Introducing the 24-2C Visual Field Test in Neuro-Ophthalmology.** *J Neuroophthalmol.* Dec 1 2021;41(4):e606-e611. doi:10.1097/WNO.0000000000001157. <https://www.ncbi.nlm.nih.gov/pubmed/33417411>; <https://www.ingentaconnect.com/content/wk/jno/2021/00000041/00000004/art00044>
2. De Luca M, Baroncini M, Matano A, et al. **Sensitivity and Specificity of the Brentano Illusion Test in the Detection of Visual Hemi-Field Deficits in Patients with Unilateral Spatial Neglect.** *Brain Sci.* Jun 9 2023;13(6):937. doi:10.3390/brainsci13060937. <https://www.ncbi.nlm.nih.gov/pubmed/37371415>
3. Saffra NA, Emborgo TS, Ranka MP, Kirsch DS. **Progressive myelinated retinal nerve fibers in a 10-year-old boy with Crouzon syndrome after craniofacial surgery.** *Am J Ophthalmol Case Rep.* Dec 2023;32:101904. doi:10.1016/j.ajoc.2023.101904. <https://www.ncbi.nlm.nih.gov/pubmed/37521804>
4. De Luca M, Zeri F, Matano A, et al. **Sensitivity and Specificity of Qualitative Visual Field Tests for Screening Visual Hemifield Deficits in Right-Brain-Damaged Stroke Patients.** *Brain Sci.* Feb 29 2024;14(3):235. doi:10.3390/brainsci14030235. <https://www.ncbi.nlm.nih.gov/pubmed/38539623>
5. Chapman-Davies A, Chapman-Davies R. **Rare presentation of peripapillary staphyloma with normal visual acuity.** *Clin Exp Optom.* May 5 2024;1-3. doi:10.1080/08164622.2024.2341834. <https://www.ncbi.nlm.nih.gov/pubmed/38706092>



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