

Orthoptist-Led Glaucoma Monitoring: A Pilot Quality Assurance Audit of the Reliability of Orthoptists in Glaucoma Management Decisions

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ABSTRACT

Background: This study aimed to evaluate the safety of an orthoptist-led glaucoma monitoring clinic in a tertiary hospital in Victoria, Australia, by reviewing the agreement between orthoptists and an experienced ophthalmologist in the clinical management decision.

Methods: A random sample of patient encounters which occurred during an 11-month period in an orthoptist-led Glaucoma Monitoring Clinic (GMC) at a tertiary hospital were randomly selected. Electronic medical records were de-identified and retrospectively reviewed by a senior consultant ophthalmologist with the clinical decision and review removed. Agreement between the clinical management decisions made by two orthoptists with a special interest in glaucoma and the ophthalmologist were analysed.

Results: When comparing agreement between the orthoptists and the ophthalmologist, agreement was noted for 18 of the 21 (85.71%) patient encounters. A kappa analysis showed substantial agreement for the clinical management decisions of patients diagnosed with a glaucoma ($\kappa = 0.690$; 95% CI 0.369 – 1.011). In addition, agreement was strong for the timing of the follow-up review with 13 of the 18 (72.2%) encounters in agreement ($\kappa = 0.639$; 95% CI 0.388 – 0.890).

Conclusion: Substantial agreement was found between orthoptists and an ophthalmologist in the management of patients who were suspected of glaucoma or diagnosed with

stable primary open angle glaucoma or ocular hypertension. This suggests that there may be a role for trained orthoptists in the screening and monitoring of glaucoma patients.

Keywords: glaucoma, glaucoma monitoring, orthoptist, inter-rater reliability

INTRODUCTION

Glaucoma is a group of eye diseases characterised by progressive degeneration of retinal ganglion cells. It is one of the leading causes of blindness,¹ and is expected to rise in prevalence with the ageing population.² Given this, it is known that there will be a significant increase in the demand for services over time and that it is unlikely that current service delivery models will be able to adequately address this increase in demand. Evidence suggests that part of the solution could be innovative change to support reform in service delivery and role extension. In other disciplines, this has been found to improve quality of care, safety and efficiency and has been reported to reduce hospital waiting lists and increase access to appropriate and timely treatment.³⁻⁵ Perhaps, just as importantly, these changes have the potential to allow increased productivity by matching allied health clinician's responsibilities with their skill levels and to relieve demands on more highly specialised medical professionals.

The extended roles of allied health professionals and the development of shared care models in the management of glaucoma have been particularly explored within the UK literature and has focused on the role of the optometrist.⁶⁻¹⁶ Whilst findings have suggested a role for allied health professionals in the co-management of glaucoma, diversity in the methodologies used in these studies has made it difficult to make sound recommendations.¹⁷ In addition, to date, few studies have reported or investigated the role of the orthoptist in glaucoma care.¹⁸⁻²¹ Orthoptists are well placed within the public health care system in Australia to support ophthalmology

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services as they are the core allied health provider of eye-related services in this sector.²² In Australia, orthoptists not only specialise in their traditional role, the diagnosis and management of eye movement disorders, but also provide significant allied health support for general ophthalmology and neuro-ophthalmology services.²³ Whilst numerous studies have investigated the orthoptists' extended roles within eye health care and reported the high reliability of orthoptists,²⁴⁻²⁷ to date only a few studies have documented the role of the orthoptist in glaucoma care,¹⁸⁻²¹ with two having examined the orthoptists' accuracy in evaluating optic nerve parameters in normal and glaucomatous patients.^{18,20} The latter studies finding that orthoptists provided highly reproducible and consistent findings with experienced glaucoma specialists. The aim of our study was to audit the agreement between the orthoptists' and ophthalmologist's clinical management decision, as related to an appropriate follow-up timeframe of patients suspected or diagnosed with glaucoma who were consulted in an established orthoptist-led glaucoma monitoring clinic.

METHODS

Participants

Orthoptists who were involved in an orthoptist-led Glaucoma Monitoring Clinic (GMC) in a tertiary hospital in Victoria were included in this study. This included two orthoptists; one with over 10 years of clinical experience and one with 5 years of clinical experience. Both had a special interest in glaucoma care, with the more senior orthoptist also being involved in an interdisciplinary glaucoma clinic at another tertiary hospital. The management decision of the orthoptists was compared to the most senior consultant ophthalmologist of the department.

Patient population

A random sample of patient encounters that occurred during an 11-month period in the GMC were retrospectively reviewed. Electronic medical records, including the patients' previous ophthalmology clinical notes and test results were printed and de-identified.

Patients referred to the GMC were either glaucoma suspects or had been diagnosed with ocular hypertension or stable early primary open angle glaucoma (POAG). Referral to the GMC considered the patients' risk factors, optic disc findings, optical coherence tomography (OCT), Humphrey visual field (HVF) mean deviations, intraocular pressure (IOP) and current glaucoma medical management. Table 1 indicates the referral criteria for the GMC. All patients in the GMC were assessed by one of the two orthoptists who had undergone an initial workplace competency training program. This program comprised the orthoptists being involved in a weekly glaucoma clinic for approximately three months, where practical hands-on clinical teaching was delivered by the ophthalmology team. Clinical competency of the orthoptists was met when (i) the dilated examination and interpretation of the optic disc, including optic disc drawing and documentation of optic disc haemorrhage, was considered accurate by the principal glaucoma ophthalmologist and when (ii) thirty accurate IOP measurements were undertaken in two glaucoma patient subgroups (normal and high IOP >21 mmHg) with accuracy being defined as within 2 mmHg of the principal glaucoma ophthalmologist's reading.

Procedures

Electronic clinical records of patient encounters in the GMC included the clinical findings of the orthoptist at the time of the

Table 1. Inclusion criteria for the Glaucoma Monitoring Clinic

Factors	Ocular hypertension	Glaucoma suspect	Stable early POAG
Risk factors	No risk factors	Multiple risk factors (FH, myopia >-4D)	+/- Risk factors
Optic disc	NAD	+/- Abnormal	Glaucomatous disc changes (notching, thinning ON rim)
OCT	NAD	+/- Abnormal	+/- Abnormal
Visual field	NAD	+/- Abnormal	HVF defect; MD <-6 dB & stable HVF changes over 2 years
IOP	22 – 29 mmHg	<22 mmHg	-
Management	May/may not be on topical glaucoma Rx	May/may not be on topical glaucoma medication	Topical Rx or laser; IOP within target range

dB = decibels, FH = family history, HVF = Humphrey visual field, IOP = intraocular pressure, MD = mean deviation, OCT = optical coherence tomography, ON = optic nerve, Rx = prescription

encounter. This included any patient complaint, medication and adherence to medication, best-corrected visual acuity (BCVA), intraocular pressure, anterior segment examination, dilated fundus examination, Humphrey visual field assessment and retinal nerve fibre layer analysis (RNFL) with an OCT. The visual field and OCT outputs both included a glaucoma progression analysis where a patient had been examined at least three times on the relevant instrument. The mean deviation (MD) in decibels (dB) was also recorded for each visual field analysis. Central corneal thickness (CCT), gonioscopy, vertometry and subjective refraction were also included, where relevant. In addition to this, the medical record included the target IOP, as previously suggested by the ophthalmology team. Table 2 includes the clinical assessment protocol for the GMC.

In accordance with clinic protocol, the orthoptists managed the patients referred to the GMC by categorising the patient as either 'flagged' or 'not flagged' for review. Patients whose condition was considered stable were not flagged, they were considered non-urgent and to be reviewed in six months with the ophthalmologist. Flagged patients were considered to have possible disease progression and as such required a sooner follow-up review. The flagged patients were further subdivided into 'urgent' (contact ophthalmology registrar on call) and 'semi-urgent' (to be reviewed by consultant in less than two months). Table 3 provides a guide as to the clinical characteristics for each categorisation. This protocol was broadly developed based

on Australia's National Health and Medical Research Council (NHMRC) Glaucoma Guidelines²⁸ and the United Kingdom's National Institute for Health and Care Excellence (NICE) Glaucoma Guidelines.²⁹

For the purposes of this study, the clinical data of the included encounters were subsequently de-identified and presented to an experienced leading consultant ophthalmologist to review without the orthoptist's clinical decision. Only test results were provided. Based on these notes, the ophthalmologist was required to determine if the patient should have been 'flagged' or 'not flagged'. Agreement was determined by comparing the orthoptists' management recommendations with that of the consultant ophthalmologist.

Overall, the data collected included patient demographics, glaucoma diagnosis, glaucoma medication at the time of the encounter, target IOP, presence of other ocular or systemic conditions, the clinical test results at the time of encounter as per Table 2, and the management recommendation including 'flagging' status and the recorded timing of the recommended follow-up review in weeks.

Data analysis

All data was entered into an Excel spreadsheet and later imported into SPSS version 20 for statistical analysis. Descriptive statistics were used to illustrate the characteristics

Table 2. Clinical assessment in the Glaucoma Monitoring Clinic

Clinical assessment	Investigations
History and complaints	Subjective visual change Complaints or concerns Current medications Specific questioning on compliance with drops
Best-corrected visual acuity	Snellen's visual acuity Refraction and vertometry as required
Intraocular pressure	Goldman applanation
Ocular coherence tomography	Zeiss Cirrus Retinal nerve fibre layer (Glaucoma progression analysis as available)
Visual field	Humphrey visual field – Sita 24-2 (Glaucoma progression analysis as available)
Anterior segment exam	Slit lamp
Dilated fundus exam	Slit lamp 90D indirect, 70D indirect lenses Optic disc drawing
Refraction (as required)	Subjective refraction Vertometry
Central corneal thickness (as required)	Ocuscan
Gonioscopy (as required)	Single mirrored gonio lens

of the study population including diagnosis, BCVA, IOP and the management recommendation. The agreement for the management recommendation between the orthoptist and the blinded consultant ophthalmologist was determined by using the kappa statistic. Kappa was interpreted in accordance with the ranges suggested by Landis and Koch³⁰ whereby 1.00-0.81 = near perfect agreement; 0.80-0.61 = substantial agreement; 0.60-0.41 = moderate agreement; 0.40-0.21 = fair agreement; 0.20-0.01 slight agreement; <0 = poor agreement. Additionally, 95% confidence interval (CI) was calculated to evaluate the agreement between the orthoptists and the ophthalmologist.

Where a patient was 'flagged', further agreement was assessed by comparing the timing of the follow-up review suggested by the orthoptist and the consultant ophthalmologist. Whilst the protocol provided recommendations for urgent, semi-urgent and non-urgent patients, some clinicians provided an alternative time of review for 'flagged' (urgent and semi-urgent) patients. This analysis addressed the reliability of the orthoptists' management decision in these instances.

RESULTS

Patient population

A total of twenty-five patient encounters were included. Each encounter is a patient visit to GMC. Four of these patient encounters were excluded from the data analysis. Of these four, two encounters did not meet inclusion criteria for the clinic as the patients had a history of acute angle closure glaucoma, two encounters had an incomplete clinical assessment due to either the patient being unwell or repeat testing required as a result of unreliable results. As such, a total of 21 clinic encounters of 19 participants were included for analysis.

The mean age at time of attendance was 70.57 years (SD ± 7.76), with a range from 58 to 86 years. Twelve of the 21 encounters were referred with a clinical diagnosis of glaucoma suspect (57.14%), seven with stable POAG (33.33%) and two with ocular hypertension (9.52%). Visual acuity in the right eye ranged from 6/5 to 2/60 with 15 of the 21 (71.43%) having a visual acuity of 6/7.5 or better, whilst in the left eye visual acuity ranged from 6/5 to 3/30 with 16 of the 21 (76.19%) having 6/7.5 or better. Intraocular pressures ranged from 11 to 25 mmHg in the right eye (mean 14.64 mmHg) and similarly from 11 to 25 mmHg in the left (mean 14.76 mmHg).

Reliability of management recommendations

Agreement on flag

When comparing the clinical management decision, agreement was found in 18 of the 21 (85.71%) patient encounters showing substantial agreement ($\kappa = 0.690$; CI 0.369 – 1.011), whilst three of the 21 (14.29%) clinical decisions of the encounters differed. Of the 18 patient encounters where there was agreement, 12 of these encounters were patients who were considered stable and non-urgent. Six of the 18, on the other hand, were flagged as either urgent or semi-urgent.

As noted in Table 4, two of the three disagreements (patient encounter 2 and 13) were such that the orthoptist flagged the patient encounter as needing a more urgent follow-up as compared to the consultant. One of the three patient encounters (encounter 12) showed disagreement on flag such that the consultant had flagged the encounter as more urgent than the orthoptist.

Patient encounter 2 was a 69 year-old patient with type II diabetes and a strong family history of POAG. They had previously had a

Table 3. Clinical decision making in the Glaucoma Monitoring Clinic

Category	Flagged	Flagged	Not flagged
Urgency	Urgent	Semi-urgent	Non-urgent
Criteria	Sudden onset vision loss Sudden onset diplopia Painful red eye IOP >35 mmHg Visual field loss suggestive of neurological origin Sudden onset floater/flashes last 4/52 Any other significant concern	IOP 2 mmHg ≥ target IOP ↓ MD of HVF ≥ 2 dB HVF GPA likely progression GPA Cirrus OCT likely RNFL loss Stopped plan to stop Rx due to allergy/intolerance New OD haemorrhage Any other significant concern requiring early review	Not Flagged
Action	Contact Ophthalmology Registrar on call	Appointment made in Consultant Glaucoma clinic <2/12	6/12 appointment Consultant Glaucoma clinic for routine annual review (and reviewed in GMC as appropriate)

dB = Decibels, GPA = glaucoma progression, IOP = intraocular pressure, MD = mean deviation, OD = optic disc, RNFL = retinal nerve fibre layer, Rx = prescription

Table 4. Patient encounters with disagreement on flag

Patient encounter	Flagged status		
	GMC	Consultant	Agreement status
2	Yes	No	Disagreement
12	No	Yes	Disagreement
13	Yes	No	Disagreement

right retinal detachment and subsequent surgery. There was no sign of diabetic retinopathy in previous clinical notes. Intraocular pressure was 11 mmHg in both eyes and VA was 2/60 in the right and 6/6 in the left. This patient had been receiving topical treatment for ocular hypertension for the past 18 months and was being managed cautiously due to the strong family history and reduced visual potential already in the one eye as a result of the retinal detachment. The orthoptist noted a new change on visual field testing with an early superior arcuate loss of the left eye and MD change of -4.45 dB. On dilated exam, new presentation of a tortuous dark vessel was also noted in the sound left eye. This patient was flagged as needing review with the consultant in less than two months as per the GMC protocol. However, on reviewing the notes the consultant ophthalmologist classified the encounter as non-urgent and recommended a six-month review with a consultant.

Patient encounter 13 involved a 64 year-old patient with ocular hypertension who was not receiving any ocular topical therapy. Best-corrected visual acuity was 6/5 for both eyes and IOP measured 22 mmHg for both right and left. OCT and CCT were within normal limits. Visual field testing showed a MD loss of 1.49 dB of the right eye and 3.28 dB of the left eye. The orthoptist in the GMC noted a possible lens artefact attributing to the visual field loss but despite this, flagged the patient for review within the consultant clinic in less than two months. On reviewing the clinical notes, the consultant ophthalmologist also noted that the visual field loss was very likely an artefact secondary to the lens frame and did not flag the patient, rather requesting visual field testing in six months in the consultant clinic.

Patient encounter 12 involved a 64 year-old patient with ocular hypertension who was not receiving any ocular topical therapy. Best-corrected visual acuity was 6/5 for the right and left eyes and testing on HVF, OCT and CCT were all within normal limits. Intraocular pressures were found to be 25 mmHg in either eye. Whilst the orthoptist in the GMC did not flag this patient, the ophthalmologist flagged the patient due to the measured IOP. It is notable that a target IOP was not recorded in the notes of this patient and that inclusion criteria for referral to the GMC was 22 – 29mmHg. This may have influenced the orthoptist's decision.

Agreement on timing of review for flagged encounters

Thirteen of the 18 (72.2%) encounters showed agreement on the timeframe of the follow-up review, demonstrating substantial agreement on kappa analysis ($\kappa = 0.639$; 95% CI 0.388 – 0.890). Table 5 provides an overview of the agreement and disagreement of the clinicians in relation to timing of review.

Of the five patient encounters showing disagreement, three had an earlier review suggested by the orthoptist as compared to the consultant (patient encounters 5, 6 and 18). As per protocol, the orthoptist recommended these patients be reviewed by a consultant in six months given stable clinical findings, however the ophthalmologist suggested a twelve-month review. The remaining two patient encounters (9 and 11) were flagged by both orthoptist and ophthalmologist, but there was disagreement on the timeframe for the follow-up review.

Encounter 10 was noted to have OCT changes by both clinicians and possible bayoneting of vessels by the orthoptist. The orthoptist requested a one-month review by the consultant, whilst the ophthalmologist suggested a four-month review. For patient encounter 9, whilst both clinicians flagged the patient encounter, the orthoptist recommended a 6-month review whilst the ophthalmologist a 3-month review. This encounter was a 58 year-old glaucoma suspect patient with BCVA of 6/6 for the right eye and 3/60 for the left, IOP of 22 mmHg and 18 mmHg of the right and left eyes respectively, and a normal OCT of either eye. Visual field testing showed depreciated MD of -2.84 dB of the right eye and -6.28 dB of the left. The patient also had a previous diagnosis of central serous retinopathy of the left eye and Marfan's syndrome.

DISCUSSION

The purpose of this study was to undertake a quality assurance audit of the agreement between the management recommendations of orthoptists and one experienced ophthalmologist in an orthoptist led glaucoma clinic. To date, few studies have investigated the reliability of orthoptists in glaucoma care.¹⁸⁻²⁰ However, recent studies have shown that the orthoptist's assessment of normal and glaucomatous optic discs is consistent with that of an experienced ophthalmologist when using Heidelberg Retinal Tomography and a stereoscopic non-mydriatic camera,²⁰ and that moderate agreement can be

found between experienced orthoptists and ophthalmologists when examining optic disc images for signs of glaucoma.¹⁹

Several studies have explored the role of the optometrist in the management or co-management of patients with glaucoma, particularly within the United Kingdom.⁶⁻¹⁶ Many of these studies have reported the reliability of allied health professionals in shared care models and suggest that appropriately trained non-medical professionals are able to safely undertake a greater role in monitoring glaucoma patients.¹⁷

In concordance with this, we found a substantial agreement between the orthoptists and the ophthalmologist in their management recommendation of glaucoma patients, with similar levels of agreement as those reported in the optometric literature.^{6,7,10,11} Despite these similar findings, it is important to note that results cannot be directly compared as agreement has been based on different outcome measures. These studies have investigated the agreement on the timing of the follow-up review,⁷ the need for treatment,⁶ and on the medical management of patients as related to initiating, increasing and decreasing treatment,⁷ or to a specific protocol¹⁰ or algorithm.¹¹ Others have evaluated the agreement of specific clinical tests planned or undertaken.^{7,10} It is also noteworthy that in our study the GMC included patients with stable POAG, ocular hypertension and glaucoma suspects, which is similar to some glaucoma clinics reported in the literature,¹⁰ but not all. Other studies have also included patients with a new glaucoma referral for triage and other types of glaucoma.^{6,7,11}

In relation to the timing of follow-up, our findings were similar to the literature that suggests that allied health professionals

are generally more conservative or cautious with their timing of follow-up than medical practitioners in glaucoma care.^{7,10} It is noteworthy that in the few instances where the orthoptist was less conservative than the ophthalmologist, the encounter was either missing clinical information in the medical record or was a complex case. One encounter related to the target IOP being excluded from the notes, which may have led to the disagreement observed between the clinicians and the other was a patient with central serous retinopathy and Marfan's syndrome. This latter disagreement may suggest that exclusion of patients with several comorbidities from an orthoptist-led GMC should be considered.

It is important to note some of the limitations of our study. In particular, this was a quality assurance audit of a newly introduced model of care in a tertiary hospital in Victoria representing its initial outcomes with a small cohort of patients. The study was also retrospective in nature and the ophthalmologist could only make a decision on the clinical notes presented, without seeing the patient at the time of the encounter. It would be worthwhile to have future studies assess agreement using a prospective study design and incorporating a greater number of orthoptists.

CONCLUSION

In conclusion, this study found that patients with stable POAG, ocular hypertension and glaucoma suspects can safely be monitored by orthoptists in a shared care model. Results of this study showed that there is substantial agreement between orthoptists and an experienced ophthalmologist when making management recommendations.

Table 5. Patient encounters with agreement on flag, disagreement on review timeframe

Patient encounter	Flagged status		Timeframe for review	
	GMC	Consultant	Agreement status	Agreement status
1	Yes	Yes	Agreement	Agreement
3	No	No	Agreement	Agreement
4	No	No	Agreement	Agreement
5	No	No	Agreement	Disagreement
6	No	No	Agreement	Disagreement
7	No	No	Agreement	Agreement
8	No	No	Agreement	Agreement
9	Yes	Yes	Agreement	Disagreement
10	Yes	Yes	Agreement	Disagreement
12	No	No	Agreement	Agreement
14	No	No	Agreement	Agreement
15	No	No	Agreement	Agreement
16	Yes	Yes	Agreement	Agreement
17	Yes	Yes	Agreement	Agreement
18	No	No	Agreement	Disagreement
19	No	No	Agreement	Agreement
20	Yes	Yes	Agreement	Agreement
21	No	No	Agreement	Agreement

REFERENCES

1. Tham YC, Li X, Wong TY, et al. global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. *Ophthalmology* 2014;121(11):2081-2090.
2. Wang W, He M, Li Z, Huang W. Epidemiological variations and trends in health burden of glaucoma worldwide. *Acta Ophthalmol* 2019;97(3):e349-e355.
3. Schwarz M, Ward EC, Seabrook M, et al. Outcomes from an extended scope of practice speech-language pathology service for low risk ENT outpatients: a 5-year service review. *Int J Speech Lang Pathol* 2021;Jun 2:1-9.
4. Thompson J, Yoward S, Dawson P. The role of physiotherapy extended scope practitioners in musculoskeletal care with focus on decision making and clinical outcomes: a systematic review of quantitative and qualitative research. *Musculoskeletal Care* 2017;15(2):91-103.
5. Pokorny MA, Wilson WJ, Whitfield BC, Thorne PR. Effectiveness and safety of advanced audiology-led triage in pediatric otolaryngology services. *Ear Hear* 2020;41(5):1103-1110.
6. Azuara-Blanco A, Burr J, Thomas R, et al. The accuracy of accredited glaucoma optometrists in the diagnosis and treatment recommendation for glaucoma. *Br J Ophthalmol* 2007;91(12):1639-1643.
7. Banes MJ, Culham LE, Bunce C, et al. Agreement between optometrists and ophthalmologists on clinical management decisions for patients with glaucoma. *Br J Ophthalmol* 2006;90(5):579-585.
8. Chawla A, Patel I, Yuen C, Fenerty C. Patterns of adherence to NICE glaucoma guidance in two different service delivery models. *Eye (Lond)* 2012;26(11):1412-1417.
9. Gray SF, Spry PG, Brookes ST, et al. The Bristol shared care glaucoma study: outcome at follow up at 2 years. *Br J Ophthalmol* 2000;84(5):456-463.
10. Marks JR, Harding AK, Harper RA, et al. Agreement between specially trained and accredited optometrists and glaucoma specialist consultant ophthalmologists in their management of glaucoma patients. *Eye (Lond)* 2012;26(6):853-861.
11. Wright HR, Diamond JP. Service innovation in glaucoma management: using a web-based electronic patient record to facilitate virtual specialist supervision of a shared care glaucoma programme. *Br J Ophthalmol* 2015;99(3):313-317.
12. Lakhani BK, Giannouladis K, Leighton P, et al. Defining stable glaucoma: a delphi consensus survey of UK optometrists with a specialist interest in glaucoma. *Eye (Lond)* 2021;35(9):2524-2534.
13. Jindal A, Myint J, Edgar DF, et al. Agreement among optometrists and ophthalmologists in estimating limbal anterior chamber depth using the van Herick method. *Ophthalmic Physiol Opt* 2015;35(2):179-185.
14. Shah SM, Choo C, Odden J, et al. Provider agreement in the assessment of glaucoma progression within a team model. *J Glaucoma* 2018;27(8):691-698.
15. Vernon SA, Adair A. Shared care in glaucoma: a national study of secondary care lead schemes in England. *Eye (Lond)* 2010;24(2):265-269.
16. Phu J, Wang H, Khuu SK, et al. Anterior chamber angle evaluation using gonioscopy: consistency and agreement between optometrists and ophthalmologists. *Optom Vis Sci* 2019;96(10):751-760.
17. Scheetz J, Koklanis K, Long M, et al. Validity and reliability of eye healthcare professionals in the assessment of glaucoma – a systematic review. *Int J Clin Pract* 2015;69(6):689-702.
18. Scheetz J, Koklanis K, McGuinness M, et al. A randomized trial to increase the assessment accuracy of glaucoma and optic disc characteristics by orthoptists. *J Cont Educ Health Prof* 2019;39(3):161-167.
19. Scheetz J, Koklanis K, McGuinness M, et al. Gaze behaviour and accuracy among novice and glaucoma specialist orthoptists during optic disc examination: a cross sectional study. *Aust Orthopt J* 2019;51:17-24.
20. Asakawa K, Kato S, Shoji N, et al. Evaluation of optic nerve head using a newly developed stereo retinal imaging technique by glaucoma specialist and non-expert-certified orthoptist. *J Glaucoma* 2013;22(9):698-706.
21. Gleeson D. The Multidisciplinary Glaucoma Monitoring Clinic at the Royal Victorian Eye and Ear Hospital. *Aust Orthopt J* 2013;45:15-18.
22. Metropolitan Health and Aged Care Services, Department of Human Services. Victorian ophthalmology service planning framework discussion paper; 2004 [Cited 2021 1st Aug] Available from: http://www.health.vic.gov.au/ophthalmology/opthservice_planning_%20discpaper.pdf.
23. The International Centre for Allied Health Evidence. Strengthening the orthoptic workforce, ACT health directorate: a systematic review of the role, effectiveness & training of orthoptists; 2013 [Cited 2021 1st Aug] Available from: <https://www.unisa.edu.au/contentassets/13f4efb27a9247a49e829e05e41a613a/in-development/6.-final-orthoptics-report-.pdf>.
24. Cramer A, Koklanis K, Dayoub Z, Gazarek J. Investigating the effectiveness of an orthoptic-led diabetic retinopathy screening clinic. *Aust Orthopt J* 2016;48:14-18.
25. Georgievski Z, Koklanis K, Fenton A, Koukouras I. Victorian orthoptists' performance in the photo evaluation of diabetic retinopathy. *Clin Exp Ophthalmol* 2007;35(8):733-738.
26. Lim YE, Vukicevic M, Koklanis K, Boyle J. Indication for anti-VEGF treatment for neovascular age-related macular degeneration based on optical coherence tomography interpretation: decision agreement rate between orthoptist and ophthalmologist. *Aust Orthopt J* 2014;46:9-13.
27. Scheetz J, Koklanis K, Long M, Morris ME. Accuracy and efficiency of orthoptists in comprehensive pediatric eye examinations. *Am Orthopt J* 2016;66(1):98-106.
28. National Health and Medical Research Council. Guidelines for the screening prognosis, diagnosis, management and prevention of glaucoma. Canberra: NHMRC; 2010. Available from <https://www.nhmrc.gov.au/about-us/publications/guidelines-screening-prognosis-diagnosis-management-and-prevention-glaucoma>.
29. National Collaborating Centre for Acute Care (UK). Glaucoma: diagnosis and management of chronic open angle glaucoma and ocular hypertension. London: National Collaborating Centre for Acute Care (UK); 2009 Apr. (NICE Clinical Guidelines, No. 85.) Available from: <https://www.ncbi.nlm.nih.gov/books/NBK61882/>.
30. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics* 1977;33(1):159-174.