

## Orthoptic assessment and management of patients with stroke in Scotland

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### Abstract

**Aims:** To determine the current assessment and management strategies of orthoptists for patients with visual problems after stroke and to identify barriers to effective orthoptic management and priorities for future research.

**Methods:** A questionnaire was designed to gather information about vision assessments, protocols and treatments during the management of patients with stroke. Information was also collected on barriers experienced and priorities for future research. One orthoptist from each hospital eye department in Scotland was identified, telephoned and sent a questionnaire.

**Results:** We identified 14 orthoptists, covering the whole geographical area of Scotland. The questionnaire response rate was 100%. We collected detailed information on assessments and treatments used in the orthoptic management of patients with stroke. Twelve (86%) orthoptists reported that their unit did not have a protocol or management plan specific to stroke patients. The most commonly reported treatment strategies for patients with eye movement problems were provision of prisms, advice on head posture and convergence exercises. Provision of an explanation or advice was the most common management strategy for patients with visual field problems or visual neglect. The main barriers identified were a lack of a management plan (57%) and lack of funding (36%).

**Conclusions:** We have determined key aspects of the orthoptic management of patients with visual problems after stroke in Scotland. The results of this survey support the need for management plans and protocols specific to patients with stroke, and confirm a number of priorities for future research into the orthoptic management of visual problems after stroke.

**Key words:** Barriers, Orthoptists, Priorities, Stroke, Vision assessment, Vision management

### Introduction

Stroke is the greatest cause of severe disability in Scotland and the third most common cause of death.<sup>1</sup> Within Scotland 13 000 people suffer from a new stroke each year<sup>1</sup> and half of all survivors are left with severe functional problems.<sup>2</sup> There are many visual problems associated with stroke. The prevalence of visual problems after stroke reported in the literature varies considerably. One recent multicentre prospective cohort study<sup>3</sup> found that a simple screening procedure was successful in identifying patients with visual difficulties. Of the 297 patients identified as having visual difficulties, 26% had low visual acuity, 35% had ocular pathologies, 68% had eye movement deficits, 49% had visual field impairments, 20% had perceptual deficits (visuospatial neglect) and 55% had a combination of two or more visual impairments.

Visual problems can affect functional ability, quality of life, participation in rehabilitation and discharge destination following stroke.<sup>4–7</sup> It is widely acknowledged that the presence and impact of visual problems after stroke should be considered by all members of the multidisciplinary team,<sup>8</sup> and that appropriate referral to vision experts should follow.<sup>9</sup> It is recommended that orthoptists, experts in the assessment and treatment of eye movement disorders and visual impairment following stroke, should be involved in the multidisciplinary management of patients with stroke.<sup>9</sup> The key elements of orthoptic care of stroke patients are presented in the Scottish stroke rehabilitation guidelines<sup>9</sup> and clear guidelines relating to the assessment and management of patients with stroke are provided by the British and Irish Orthoptic Society.<sup>10</sup>

Despite the available national and professional guidelines, anecdotal evidence suggests that services available to people with visual problems following stroke are presently inconsistent. As part of a larger study of clinical practice in Scotland for stroke patients with visual problems, we investigated current assessment and management practices for visual problems after stroke, as reported by orthoptists.

### Aim

The primary aim of this study was to determine the current assessment and management strategies of orthoptists for patients with visual problems after stroke.

The secondary aim of this study was to identify barriers to effective orthoptic management and priorities for future research.

## Methods

Our aim was to gather information from the population of orthoptists working with stroke patients in Scotland. A postal survey was chosen as the most effective and efficient method to study national visual assessment and management practices in geographically diverse areas.<sup>11</sup>

Building on previous successful work in this area<sup>12,13</sup> we designed a questionnaire to gather the required information from orthoptists. This was designed to collect information about the stroke care setting in which the respondent worked, vision assessments and protocols used, treatments administered, referrals made, and barriers experienced. Before use, the questionnaire was tested by members of a national multidisciplinary group comprising health professionals, researchers, stroke survivors and representatives from Scottish charities relevant to stroke and vision. The questionnaire is shown in the Appendix. Our overall project aim was to gather information from orthoptists, ophthalmologists or low vision practitioners working with stroke patients. In this paper we report our findings from the orthoptist respondents.

The Heads of all Scottish orthoptic services were e-mailed with details of the survey, and asked to provide contact details for the orthoptist with lead responsibility for stroke at each hospital eye department (or covering a number of departments) in Scotland. Each named orthoptist was telephoned by a researcher who explained the nature of the project and asked the orthoptist if they agreed to participate. Questionnaires were distributed by post approximately 1 week later.

Our methods adopted procedures which have been demonstrated to maximise response rates to questionnaires.<sup>11</sup> The procedures included limiting the questionnaire to two pages in length (one double-sided A4 page); using a university logo on all correspondence; using brown envelopes, with hand written addresses; sending letters by first class post and using stamps (not franked); including a stamped addressed return envelope with all correspondence; primarily asking fact-based questions, answered by ticking a box; placing any open questions at the end of the questionnaire; avoiding sensitive questions; and ensuring anonymity.

## Results

Fourteen orthoptists were identified to respond to a survey on stroke patients with visual problems, who covered the whole geographical area of Scotland. All agreed to participate in this study, and the questionnaire response rate was 100%. All 14 orthoptists worked in an eye clinic, although 6 also reported that they worked on a stroke ward. The majority of orthoptists (13/14) reported that their patients were referred from a hospital ward, but referrals were also reported to come from general practitioners (6/14), community rehabilitation teams/social services (5/14), eye clinics (4/14) and opticians (3/14). Orthoptists reported that they saw between 1 and

10 (mean 4.6) stroke patients per month; in all cases this accounted for between 0 and 20% of their total caseload of patients.

## Orthoptic assessments in patients with stroke

### Visual acuity

All orthoptists reported assessment of visual acuity. Almost all (93%, 13/14) orthoptists reporting testing Snellen distance visual acuity in every patient, while the same number (13/14) reported testing near visual acuity either in every patient or regularly with selected patients.

### Visual field

Ninety-three per cent (13/14) of orthoptists reported assessing visual field. Confrontation was the most common technique reported: 79% (11/14) used it with every patient or regularly with selected patients, 7% (1/14) used it rarely, 7% (1/14) never used it and 1 orthoptist failed to respond. Use of quantitative measures of visual field were reported by a slightly lower majority of respondents: 71% (10/14) reported using quantitative perimetry with every patient or regularly with selected patients and 7% (1/14) reported its rare use. Twenty-one percent (3/14) reported never using quantitative perimetry, but this answer was qualified by 1 respondent who stated this was because the test was completed by other health professionals.

### Ocular movement

The tests reported to be used most frequently were the cover test, motility, convergence/accommodation and fixation/saccades/pursuit. All orthoptists reported using these tests with every patient or frequently. Most orthoptists (10–12 of 14) reported assessing fusion, stereopsis and using a Hess/Lees screen with every patient or regularly with selected patients. Half of the orthoptists (7/14) assessed optokinetic nystagmus with every patient or regularly with selected patients; the other half reported rare use of this test.

### Neglect

Eight (57%) orthoptists reported assessing neglect regularly with selected patients or with every patient, while 1 (7%) reported assessing it rarely and 5 (36%) stated that they never assess neglect.

## Orthoptic management of visual problems after stroke

Only one orthoptist reported that there was a protocol or set management guidelines specific to stroke patients in their department. Twelve (86%) orthoptists reported that their unit did not have a protocol or management plan specific to stroke patients (1 non-responder).

Table 1 illustrates the management strategies reported by the orthoptists in relation to their management of patients with stroke. The provision of an explanation or advice was the most commonly reported management strategy for patients with stroke. None of the orthoptists reported using computerised scanning training, field enlargement techniques or activities of daily living (ADL) training for any patient group.

**Table 1.** Management strategies for patients with visual problems after stroke reported by orthoptists in Scotland ( $n = 14$ )

	Visual field problem	Visual neglect	Eye movement problem
Explanation/provide information	11	10	7
Other prism	4	2	13
Advice on head posture	8	2	9
Typoscopes and reading aids	7	3	1
Referral to other professional	4	3	3
Scanning, non-computerised	7	3	0
Environmental modification	4	1	3
Convergence exercises	0	0	7
Peli prism	7	0	0
Drugs or surgery	0	0	6
Therapy for saccades, pursuits, fixation	0	0	3
Mirror spectacles	0	0	1
Other low vision aids, e.g. magnifiers	1	0	0
Scanning, computerised	0	0	0
Field enlargement	0	0	0
ADL training	0	0	0

Values are the number of orthoptists reporting use of each strategy. ADL, activities of daily living.

### Eye movement problems

Provision of prisms (other than Peli prisms) was the treatment reported to be used by the most orthoptists (13/14). Advice on head posture (9/14), convergence exercises (7/14) and drugs or surgery (6/14) were also commonly reported strategies. Three (21%) orthoptists reported that they would refer to another professional, modify the environment or provide therapy for saccades/pursuit/fixation; 1 orthoptist reported using typoscopes or reading aids and mirror spectacles.

### Visual field problems

Giving an explanation or providing information was the most frequently reported management strategy for patients with visual field problems. Advice on head posture, typoscopes and reading aids, scanning training (non-computerised) and Peli prisms were also reported as management strategies by at least half of the orthoptists (7 or 8 of 14). Using other types of prisms, referring to other professionals, modifying the environment or providing other low vision aids were also reported as treatments by a small number of orthoptists (less than 29%).

### Visual neglect

Most orthoptists (10/14) reported that they would provide an explanation or information to patients with visual neglect; however, few orthoptists reported any other management strategies for this patient group. Three (21%) reported referring to other professionals, providing typoscopes and reading aids, or giving scanning training (non-computerised). Using other prisms, giving advice on head posture, and environmental modification were the only other management strategies (reported by 1 or 2 of the 14 orthoptists).

### Advice on discharge

When a patient is discharged from the orthoptic service, 71% (10/14) stated that they would provide the patient with the contact telephone for their department and 57%

(8/14) stated that they would advise the patient about the low vision services in the hospital. Orthoptists also reported providing information about external sources of help, with 36% (5/14) telling patients about relevant UK charities, 28% (4/14) about the community stroke nurse and 7% (1/14) about community low vision rehabilitation workers.

### Barriers to management of visual problems after stroke

The main barrier identified was a lack of a unit/ward protocol or management plan, which was selected by 57% (8/14) of orthoptists; 36% (5/14) felt that lack of funding for training was a barrier. Eight respondents (57%) added free text to the questionnaire in this section: 4 of these comments referred to a lack of funding to support their services, 2 to a lack of time to provide the service, 1 to the failure of medical staff to refer patients to the orthoptic service, and 1 to the lack of stroke unit protocols.

### Priorities for future research

Eight of the orthoptists (57%) wrote down their priorities for future research. The effectiveness of treatments for visual field defects was identified by 3 respondents; the effectiveness of Peli prisms by 2 respondents, and funding for the orthoptic service by 2 respondents. Other identified priorities included determining the effectiveness of computerised scanning training and the best time to carry out assessments. Less specific research priorities included determining the impact of orthoptic care on rehabilitation and quality of life and whether the orthoptic service is 'critical'; also identifying treatments for visual neglect and determining the awareness of medical staff of orthoptic services.

### Discussion

We have been successful in gaining a comprehensive overview of key areas of current practice specific to visual problem after stroke by orthoptists in Scottish stroke care settings. This information should be central to the planning of future service delivery, stroke care management plans and protocols and future research. Stroke patients make up only a small percentage of the caseload of orthoptists in Scotland. The fact that stroke patients make up a minor proportion of orthoptic workload is likely to result in increased challenges to ensuring dedicated time for assessment and treatment of these patients, and in ensuring continuing training relevant to stroke.

Only one orthoptist reported that they worked in a unit or ward which had a management plan or protocol specific to stroke patients. There are a number of differences in the types of assessments carried out by different orthoptists. These differences may be explained by assessments being completed by other health professionals or by orthoptists seeing different populations of patients. However, there is clearly an urgent need to develop appropriate management plans and protocols

that address the assessment of visual problems after stroke and to implement these in order to attempt to provide a consistent service to patients throughout Scotland.

The results of this survey provide clear information about the treatments that orthoptists tend to use. For example, prisms are used for patients with eye movement disorders by almost all (13/14) orthoptists in Scotland, and advice on head posture and convergence exercises are both reported to be used by the majority of orthoptists (9/14 and 7/14 respectively). Arguably, although these are extensively used in practice, future research should concentrate on addressing the effectiveness of these interventions in a stroke population.

At least half the orthoptists (7 or 8 out of 14) reported providing advice on head posture, typoscopes and reading aids, scanning training (non-computerised) and Peli prisms for patients with visual field defects. The need for research into the effectiveness of these interventions was also identified by several orthoptists. Future research should address the effectiveness of these interventions. A number of priorities for future research were identified by the respondents. Based on the results of this study, we recommend that specific treatments or interventions which require further research for use with patients after stroke include: prisms, head postures and convergence exercises for eye movement problems; and head postures, typoscopes/reading aids, scanning training and Peli prisms for visual field problems. Research should address the cost of the intervention and service, who delivers the intervention, and the impact of the intervention on rehabilitation outcomes and quality of life.

Orthoptists reported few management strategies for patients with visual neglect. Interestingly, despite appearing to have a lack of management strategies to offer, few orthoptists referred these patients on to other health professionals, such as occupational therapists, who may be able to offer management strategies. However, as other health professionals, including occupational therapists, are generally core members of the multidisciplinary team, it is perhaps likely that patients with stroke will already be (or have been) in contact with other relevant health professionals. Nevertheless, exploration of joint working and improved communication between orthoptists and other health professionals relating to the management of visual neglect following stroke may be useful and beneficial to the patient.

Orthoptists in Scotland are clearly experiencing a number of barriers to their management of visual problems after stroke. A common barrier is lack of funding and subsequently a lack of time, both for orthoptic services and for further training. With the National Health Service under increasing financial pressure, it is likely that this barrier will remain. The lack of management plan or protocol was also identified by many as a barrier. Arguably, developing evidence-based management plans and protocols has the potential to address the barrier of funding and time, in addition to improving the consistency of care. Evidence for the effectiveness of orthoptic interventions is increasingly important and is essential to attempting to address the barriers faced by orthoptists.

### **Limitations**

In order to maximise response rate and to facilitate analysis, the survey primarily used closed questions and 'tick box' responses. This limited the responses that orthoptists were able to provide and did not enable respondents to qualify their responses (e.g. they could not indicate that they would use a particular assessment only with patients who had sufficient cognition, communication ability or mobility). This limits the results, as the full context of the respondents' patient population is not known. Furthermore, in an effort to maximise response rates, the survey was limited to two sides of A4. Within such space restrictions and in order to ensure the collection of some meaningful data, our questions were focused on specific topic areas. For example, the use of assessments of visual acuity was surveyed, but we were unable to include the use of management strategies, such as provision of low vision aids, for reduced visual acuity. Our choice of topic focus within this survey is not necessarily reflective of perceived priorities relating to assessment or management of patient problems.

Our study was designed to collect information about current practice, and as a result provides information about what orthoptists report they do, and does not provide any indication about the effectiveness of assessment or management strategies reported by orthoptists. The results of this survey should not be used to change (or to make recommendations to change) specific assessment or management strategies for individual patients or groups of patients with visual problems after stroke.

Following stroke, patients can have a wide range of different visual problems. We cannot assume that the population of stroke patients seen by individual orthoptists will be the same. Consequently the differences between orthoptists' responses cannot be assumed to be fundamental differences in approaches to assessment or management. Within the limited scope of this survey we have not made any attempt to determine the types of individual assessments or treatments given to patients with different visual problems. Clearly some assessments or treatments will be appropriate for some patients and not for others.

The format of the survey was designed so that it did not 'lead' respondents to provide particular responses. Accordingly, for question 4a the same 'management' options were available to patients with visual field problems, visual neglect or eye movement. It is important to note that not all the management options may be expected to be effective for the different visual problems. Consequently, responses of '0' in Table 1 only demonstrate that the management strategy is not used; they do not provide any information about whether or not these management strategies would be expected to be beneficial for the different visual problems.

### **Conclusion**

We have gathered and reported an overview of key aspects of the current orthoptic practice for patients with visual problems after stroke in Scotland. The results of this survey identify a lack of management plans and protocols specific to patients with stroke, and confirm a number of priorities for future research into the orthoptic management of visual problems after stroke.



APPENDIX

# Visual Problems after Stroke



## 1. YOUR CARE SETTING

<p><b>a. Where do you see stroke patients for visual assessment?</b> <i>please tick all that apply</i></p> <p><input type="checkbox"/> Eye clinic                      <input type="checkbox"/> Stroke Ward</p> <p><input type="checkbox"/> Community clinic</p> <p><input type="checkbox"/> other (please state) _____</p>	<p><b>b. Where are patients with stroke referred from?</b> <i>please tick all that apply</i></p> <p><input type="checkbox"/> GP    <input type="checkbox"/> Hospital Ward</p> <p><input type="checkbox"/> Optician                                      <input type="checkbox"/> Eye Clinic</p> <p><input type="checkbox"/> Community rehab / social services</p>
<p><b>c. How many <u>stroke</u> patients do you typically see per month?</b> _____</p> <p><b>What percentage of all your patients is this ?</b></p> <p><input type="checkbox"/> 0-20%      <input type="checkbox"/> 20-40    <input type="checkbox"/> 40-60%</p> <p><input type="checkbox"/> 60-80%      <input type="checkbox"/> 80-100%</p>	<p><b>d. Estimate what percentages of your stroke patients have the following problems:</b></p> <p>____ % combination of problems</p> <p>____ % visual field loss                      ____ % visual neglect</p> <p>____ % eye movement disorder              ____ % other eye problem</p>

## 2. VISUAL ASSESSMENT / PROTOCOLS

<p><b>a. Does your unit have a protocol or management plan specific to stroke patients?</b></p> <p><input type="checkbox"/> Yes (please enclose a copy)      <input type="checkbox"/> No</p> <p><input type="checkbox"/> Don't know</p>	<p><b>b. How long after their stroke, <u>on average</u>, do you carry out your assessment?</b></p> <p><input type="checkbox"/> less than 2 weeks    <input type="checkbox"/> 2-6 weeks    <input type="checkbox"/> 6 weeks – 3 months</p> <p><input type="checkbox"/> 3-6 months                      <input type="checkbox"/> more than 6 months</p>
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<b>c. How often do you use these assessments?</b> <i>Please tick all that apply</i>	<b>With every stroke patient</b>	<b>Regularly</b> <small>(with selected patients)</small>	<b>Rarely</b> <small>(with selected patients)</small>	<b>Never</b>
<b>GENERAL VISUAL ASSESSMENT</b>				
Visual Acuity - Distance				
Visual Acuity - Near				
Contrast Sensitivity				
Pupil and Lid Evaluation				
Retinal Examination				
Further Examination Techniques				
<b>VISUAL FIELD ASSESSMENT</b>				
Confrontation				
Quantitative Perimetry				
<b>OCULAR MOVEMENT ASSESSMENT</b>				
Cover Test				
Motility				
Convergence/ Accommodation				
Fixation/ Saccades/ Pursuit				
Optokinetic Nystagmus				
Sensory and Motor Fusion				
Hess/ Lees Screen				
Stereopsis				
<b>VISUAL NEGLECT ASSESSMENT</b>				
Line bisection/cancellation/balloon etc				
<b>OTHER</b>				
Please state.....				

**3. TREATMENT OF VISUAL PROBLEMS**

a. Which of the following managements do you use for the problems listed below? <i>Not all treatments are applicable to all problems</i>	Field expanding prism (Pelli)	Mirror spectacles	Other prism	Typoscopes and reading aids	Other low vision aids eg mags	Scanning – non-computerised	Scanning - computerised	Field enlargement training	Vergence exercises	Advice on head posture	Training for saccades, pursuits, fixation	Drugs or surgery	Environmental modification	ADL training	Explanation/provide info	Referral to other professional	Other
<i>Please tick all that apply.</i>																	
Visual field problem																	
Visual neglect																	
Eye movement disorder/diplopia																	
Problem relating to spectacles																	
Other visual problem																	

**b. Please give details of any specific treatment techniques or equipment you use.....**  
 .....

**c. How long do you generally continue to treat patients specifically for stroke-related problems?**  
 one-off treatment  
 up to 1 month  
 up to 3 months  
 up to 6 months  
 up to 1 year

**d. On discharge from your care, what support services do you recommend to patients with stroke-related visual problems?**  
*Please tick all that apply*  
 department contact details                       vision/stroke charities – UK wide  
 hospital low vision services                       local charities or support groups  
 community low vision rehab                       community stroke nurse  
 other treatments not available in your hospital  
 other (please state) \_\_\_\_\_

**4. BARRIERS AND SUPPORT**

**a. What barriers do you experience to the management of visual problems after stroke?**  
*Please tick all that apply.*

<input type="checkbox"/> No stroke specific care protocol / management plan	<input type="checkbox"/> Not aware of the best assessments
<input type="checkbox"/> Don't have the skills / experience I need	<input type="checkbox"/> Not aware of the best treatment options
<input type="checkbox"/> No time to gain the skills / experience I need	<input type="checkbox"/> Not enough research evidence
<input type="checkbox"/> Not enough specialist training available	<input type="checkbox"/> Poor support from other health care professionals
<input type="checkbox"/> Not enough resources to fund training	<input type="checkbox"/> Other (please state) _____

**b. Have you received training in this area from the British and Irish Orthoptic Society Special Interest Group in Stroke?**  
 Yes                       No

**c. What other training have you received in this area?**  
 (Please specify)  
 \_\_\_\_\_

**d. What are your three main priorities for research in this area?**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

**THANK YOU FOR COMPLETING THIS QUESTIONNAIRE**

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