Vision and Stroke

Arani Nitkunan

June 26th 2019

London Stroke Nurses Study Day

King's College

Croydon Health Services NHS

St George's University of London

Objectives

- Neuroanatomy
- Assessment
- Management
- Audit

13.1 Describe the basic anatomy of the visual system and the way in which visual information is processed
13.2 List the ways in which a stroke may affect an individual's vision and understand the impact these may have on their function
13.3 Demonstrate an understanding of the differences between visual inattention and hemianopia
13.4 Describe common strategies used with each type of visual impairment and demonstrate their use in clinical practice
13.5 Describe what is meant by the term perception and provide examples of how a patient with perceptual impairments might present

Incidence of visual problems in stroke

Age and Ageing 2009; **38:** 188–193
doi: 10.1093/ageing/afn230
Published electronically 21 November 2008

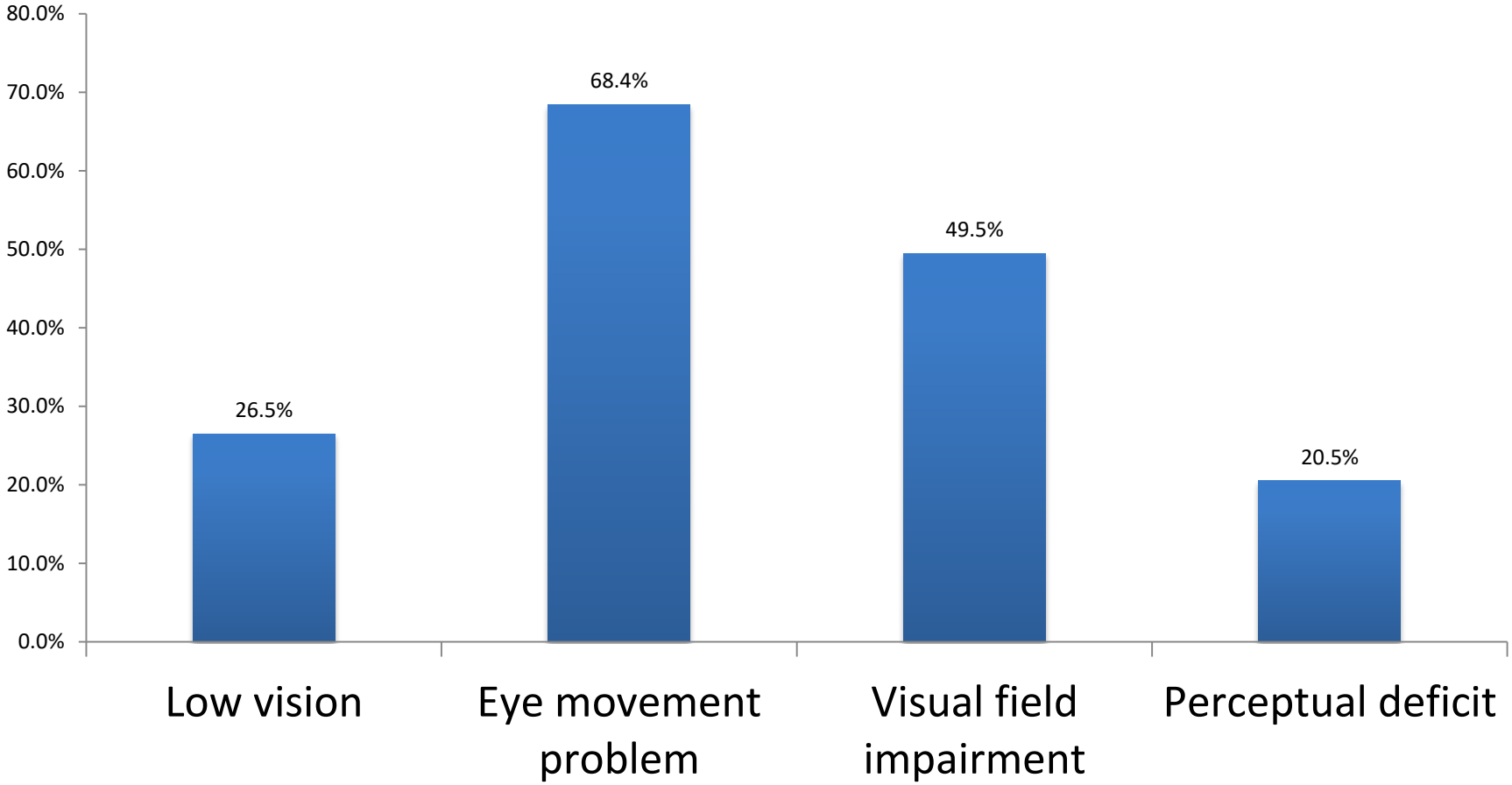
Visual impairment following stroke: do stroke patients require vision assessment?

FIONA ROWE[1], DARREN BRAND[2], CAROLE A. JACKSON[2], ALISON PRICE[3], LINDA WALKER[4], SHIRLEY HARRISON[5], CARLA ECCLESTON[6], CLAIRE SCOTT[7], NICOLA AKERMAN[8], CAROLINE DODRIDGE[9], CLAIRE HOWARD[10], TRACEY SHIPMAN[11], UNA SPERRING[12], SONIA MACDIARMID[13], CICELY FREEMAN[14]

- 1 year multi-centre prospective observational study
- 323 patients with suspected visual difficulty were recruited - limitation
- 8% had normal vision

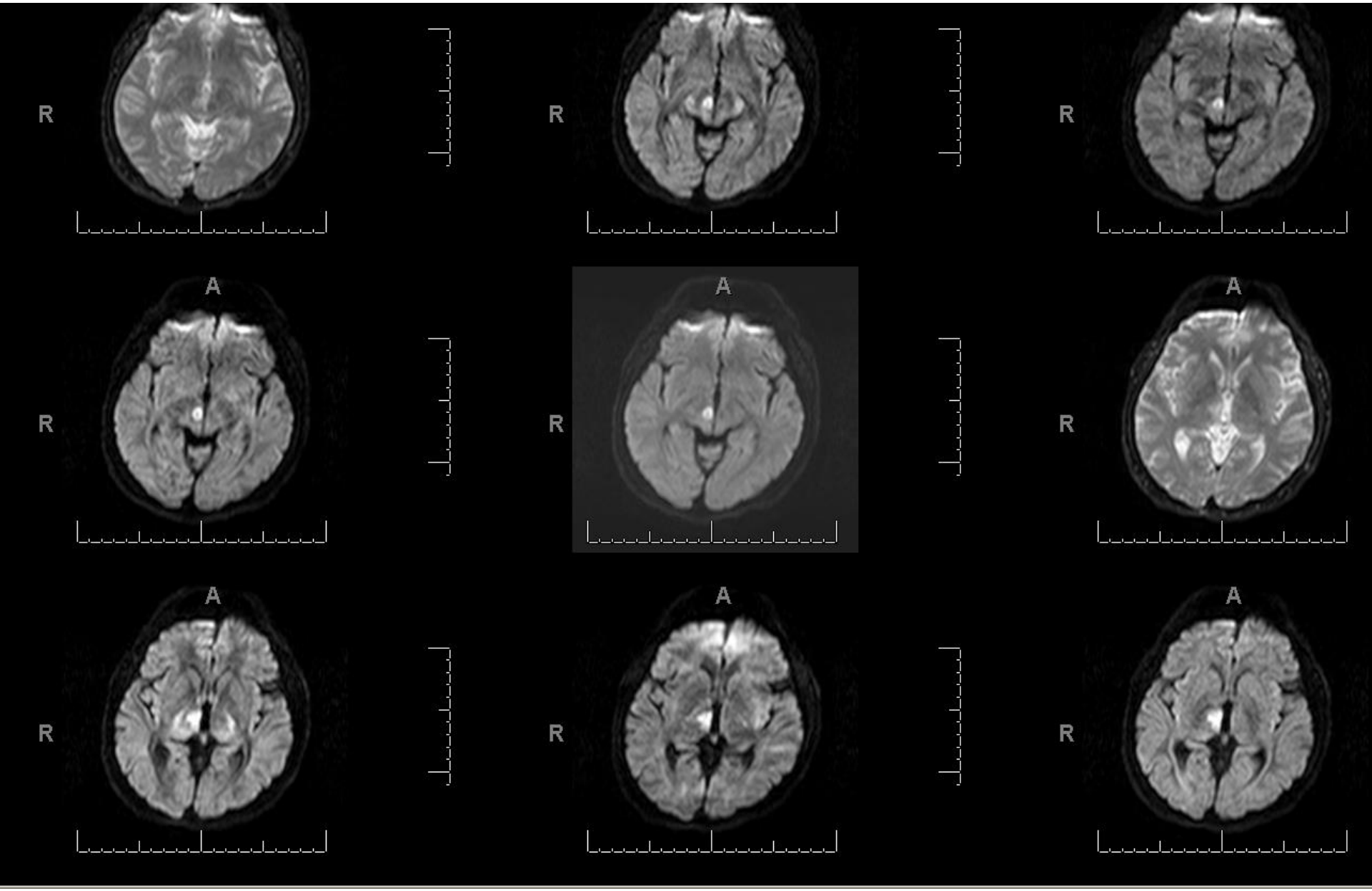
Age and Ageing 2009; **38:** 188–193
doi: 10.1093/ageing/afn230
Published electronically 21 November 2008

Visual impairment following stroke: do stroke patients require vision assessment?



Eye Movement Problem

52 year old man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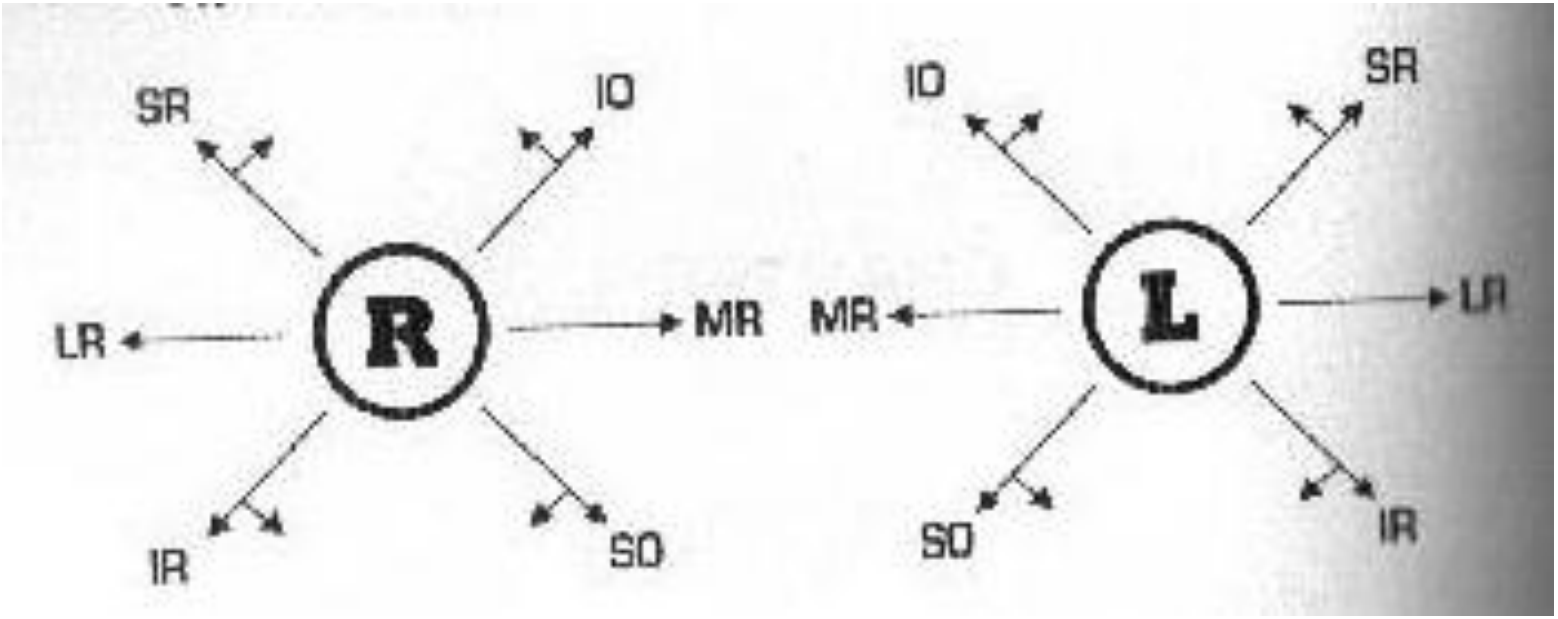
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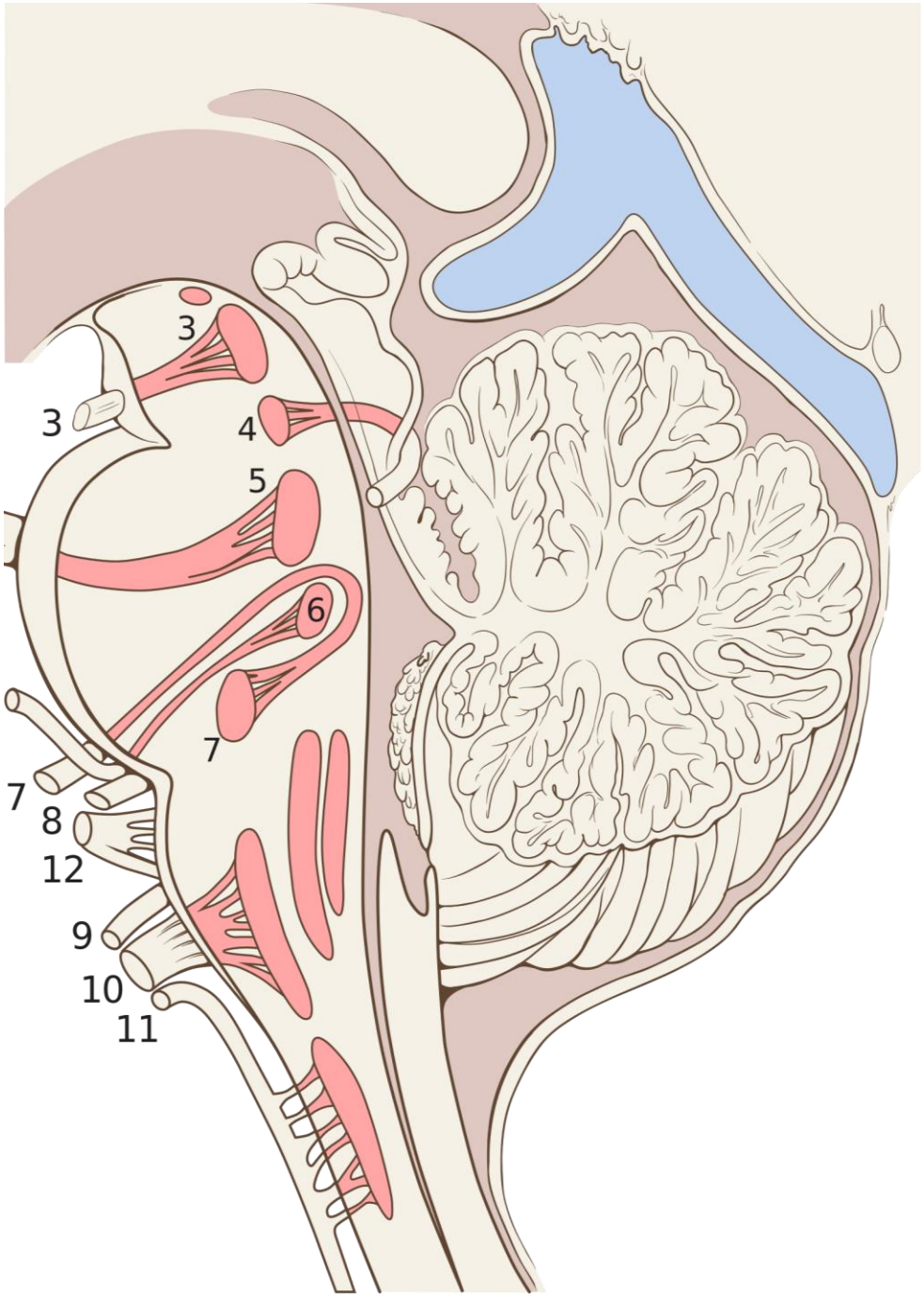
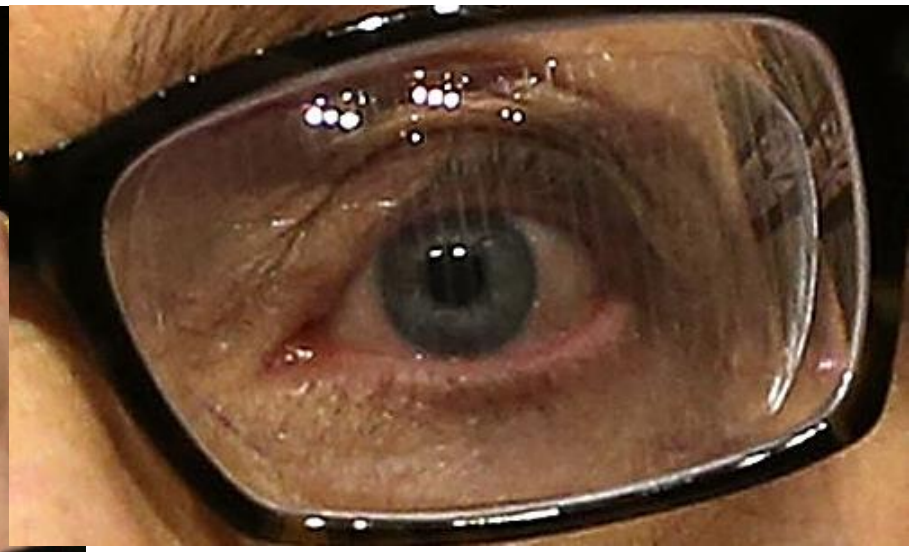


Management

- Anti-platelets
- Vascular risk factor management
  - Hypertension, diabetes, hypercholesterolaemia, smoking, alcohol, vascular stenosis, atrial fibrillation

Management of double vision

– Prisms, occlusion, advice on scanning, tracking



Visual Field Problem

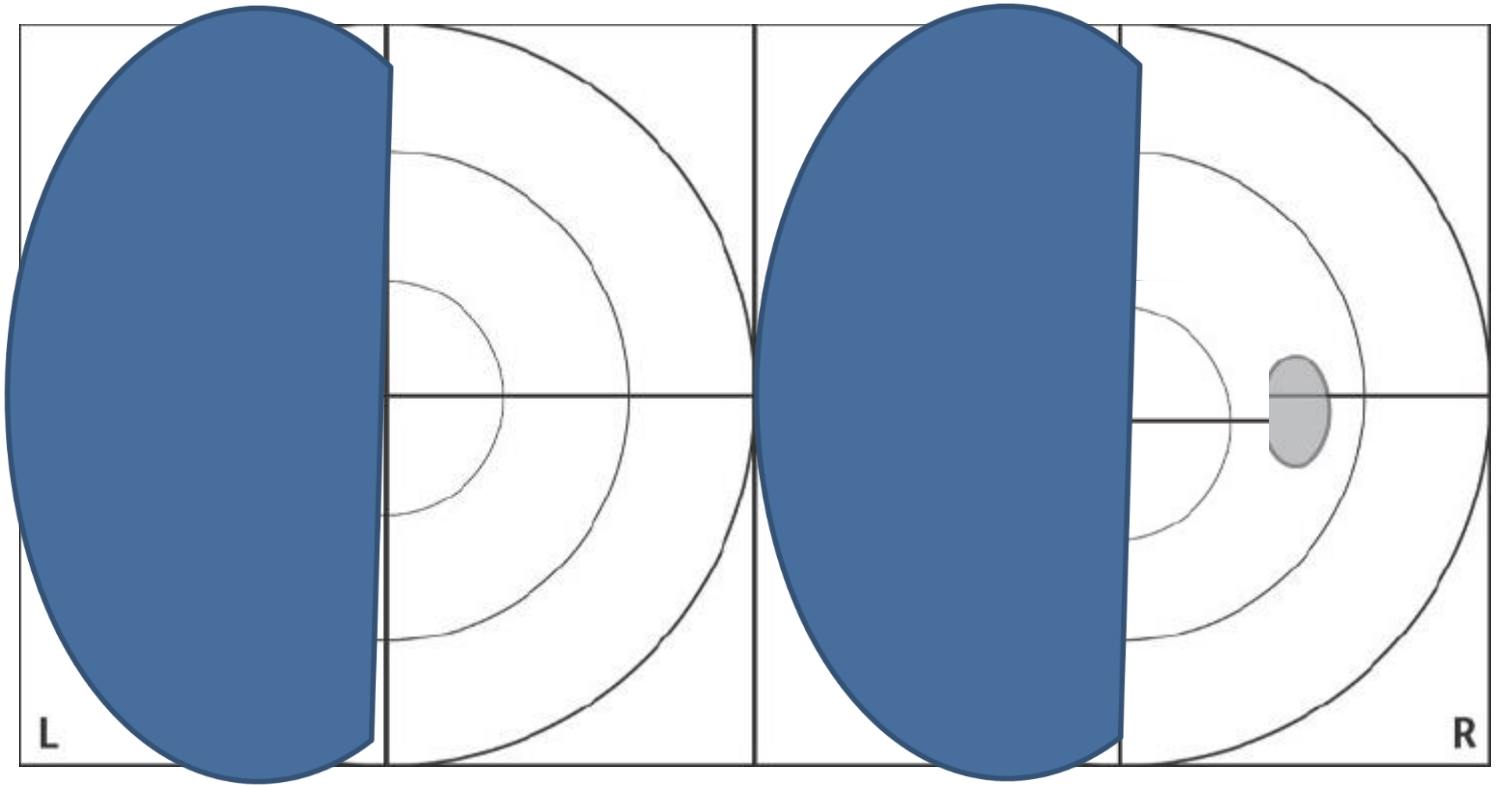
O/E

	R	L
VA	6/6	6/6
Fields		
Fundi		

Snellen chart

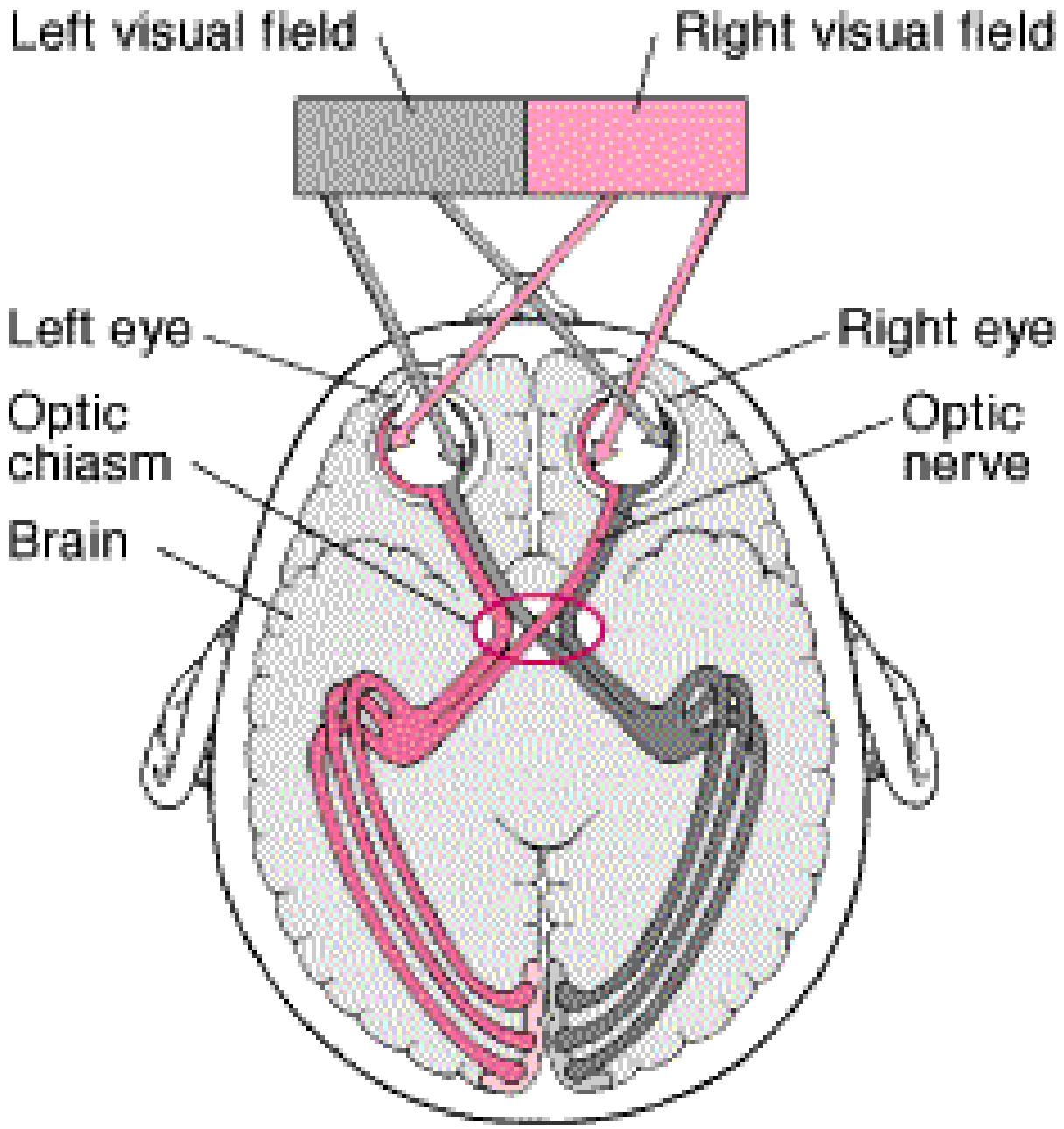
O/E

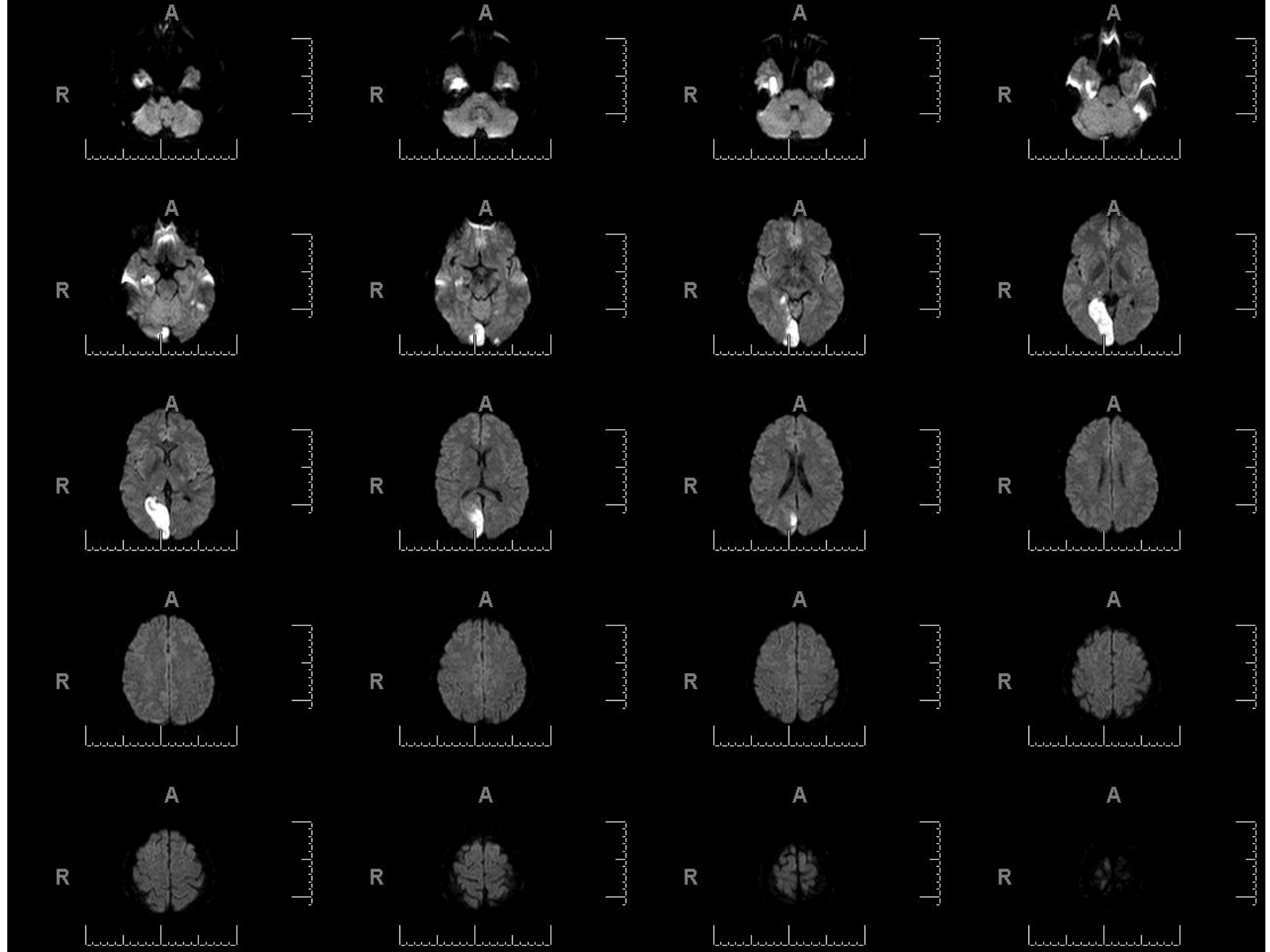
- Left homonymous hemianopia



O/E

	R	L
VA	6/6	6/6
Fields		
Fundi	normal	normal


Left visual field
Right visual field
Left eye
Right eye
Optic chiasm
Optic nerve
Brain


A
R

DVLA

Exceptional cases
GROUP 1 drivers who have previously held **full driving entitlement**, removed because of a field defect which does not satisfy the standard, may be eligible to reapply to be considered as exceptional cases on an individual basis, subject to strict criteria:

- The defect must have been present for at least 12 months
- The defect must have been caused by an isolated event or a non-progressive condition
- There must be no other condition or pathology present which is regarded as progressive and likely to be affecting the visual fields.
- The applicant has sight in both eyes
- There is no uncontrolled diplopia
- There is no other impairment of visual function, including glare sensitivity, contrast sensitivity or impairment of twilight vision.
- There is clinical confirmation of full functional adaptation

Management of visual problems

- Refer to eye clinic / orthoptist
  - Register visually impaired

Management of visual field defect

- formal assessment
- awareness
- head movements
- scanning strategies
- eccentric viewing

Visual field loss increases risk of falls.

Doesn’t alter loss but changes speed of adaptation

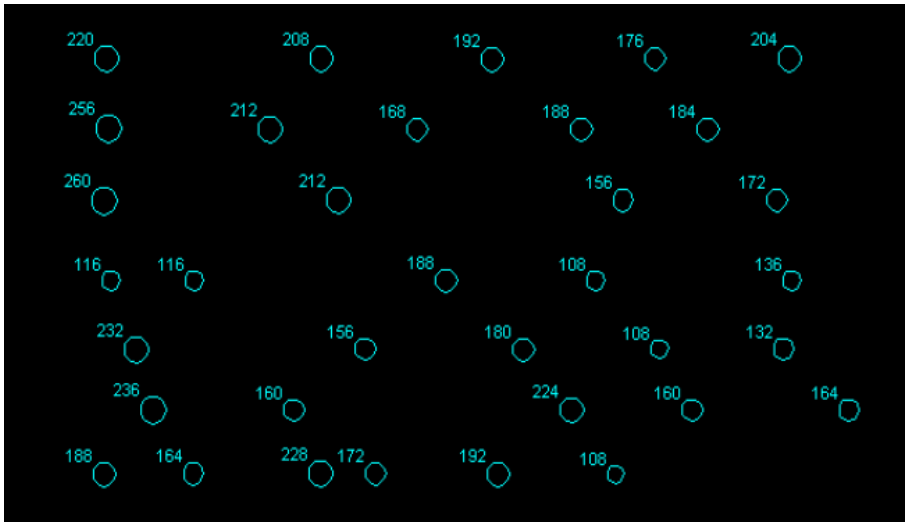
Management of visual field defect

Intervention	Study design	Outcomes	Results
Prisms	1 small RCT	Visual perception tests and Barthel ADLs	Improvement visual perception tests, no improvement ADLs
	4 non-control longitudinal	Clinical adherence	>60% at 2 months, >40% at 8 months (mean)
Eye movement therapy	2 small RCTs	Visual scanning letter cancellation	Statistically significant improvement
		Visuo-spatial matching tests	Statistically significant improvement

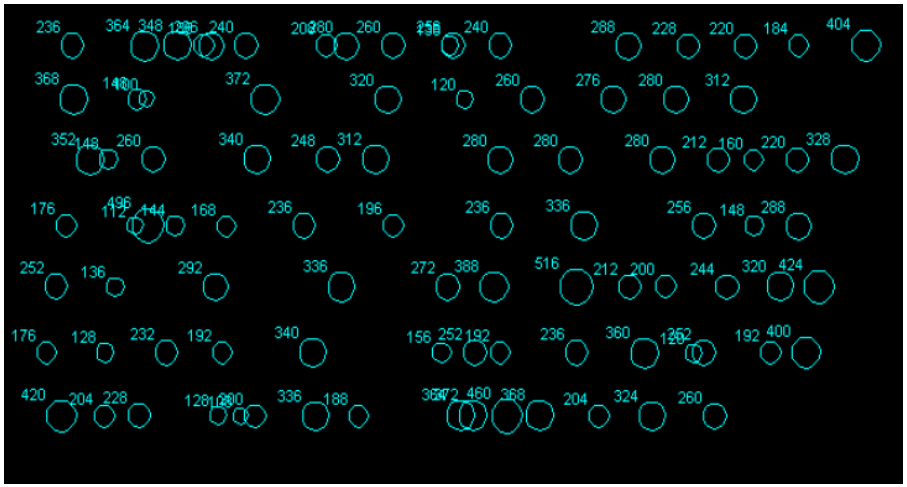
www.readright.ucl.ac.uk

Optokinetic therapy improves text reading in patients with hemianopic alexia

A controlled trial NEUROLOGY 2007;68:1922-1930



text reading fixations – normal subject
36 fixations 45 words: ratio = 0.8



text reading fixations – hemianopic alexia
93 fixations 45 words: ratio = 2.1

Optokinetic therapy improves text reading in patients with hemianopic alexia

A controlled trial

G.A. Spitzyna, MSc
R.J.S. Wise, FRCP
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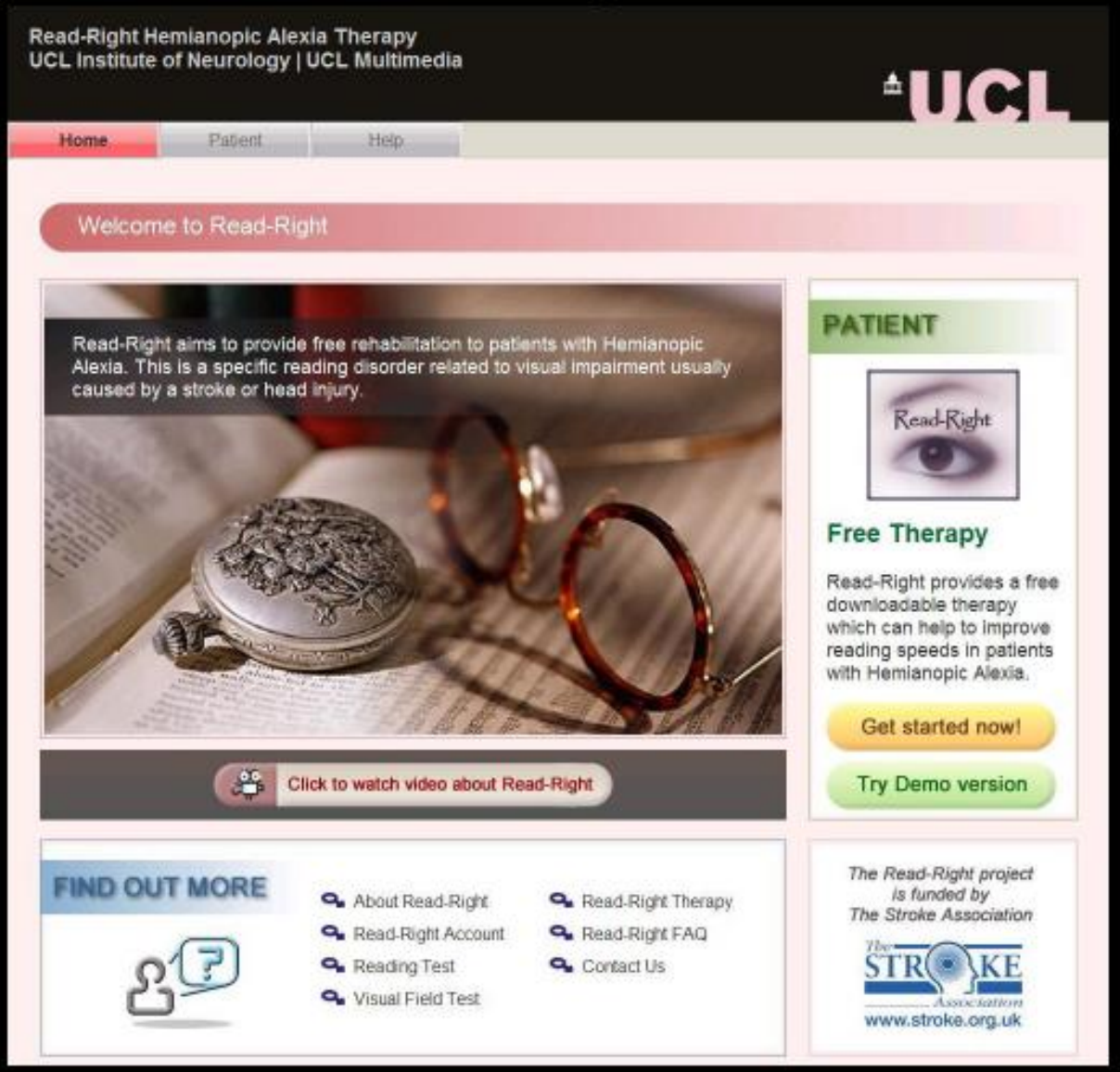
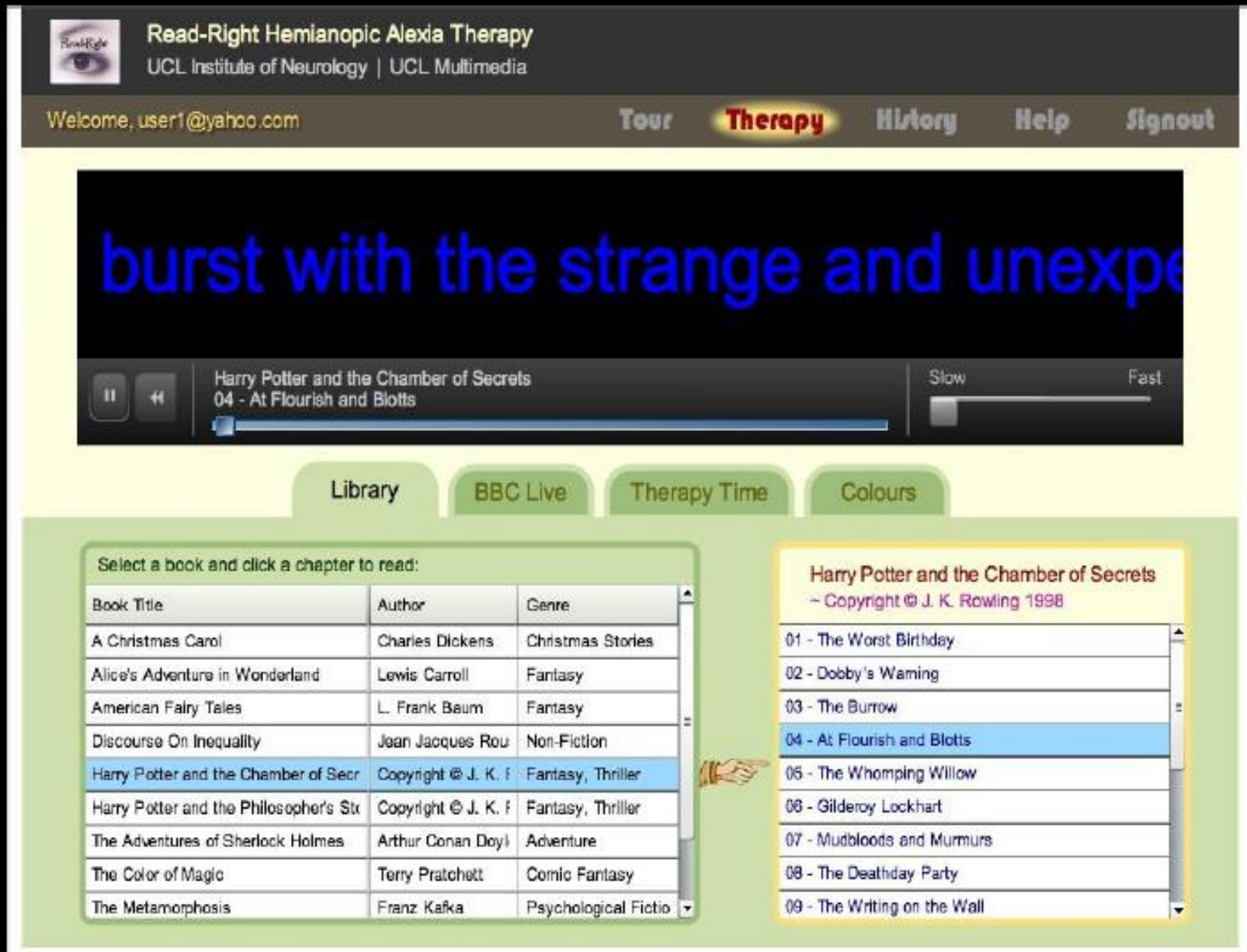
ABSTRACT Objective: An acquired right-sided homonymous hemianopia can result in slowed left-to-right text reading, called hemianopic alexia (HA). Patients with HA lack essential visual information to help guide ensuing reading fixations. We tested two hypotheses: first, that practice with a visual rehabilitation method that induced small-field optokinetic nystagmus (OKN) would improve reading speeds in patients with HA when compared to a sham visual rehabilitation therapy; second, that this therapy would preferentially affect reading saccades into the blind field. **Methods:** Nineteen patients with HA were entered into a two-armed study with two therapy blocks in each arm. One group practiced reading moving text (MT) that scrolled from right to left daily for two 4-week blocks (Group1), while the other had sham therapy (spot the difference) for the first block and then crossed over to MT for the second. **Results:** Group 1 showed significant improvements in static text reading speed over both therapy blocks (18% improvement), while Group 2 did not significantly improve over the first block (5% improvement) but did when they crossed over to the MT block (23% improvement). MT therapy was associated with a direction-specific effect on saccadic amplitude for rightward but not leftward reading saccades. **Conclusion:** Optokinetic nystagmus inducing therapy preferentially affects reading saccades in the direction of the induced (involuntary) saccadic component. This is the first study to demonstrate the effectiveness of a specific eye movement based therapy in patients with hemianopic alexia (HA) in the context of a therapy-controlled trial. A free Web-based version of the therapy used in this study is available online to suitable patients with HA. **NEUROLOGY 2007;68:1922-1930**

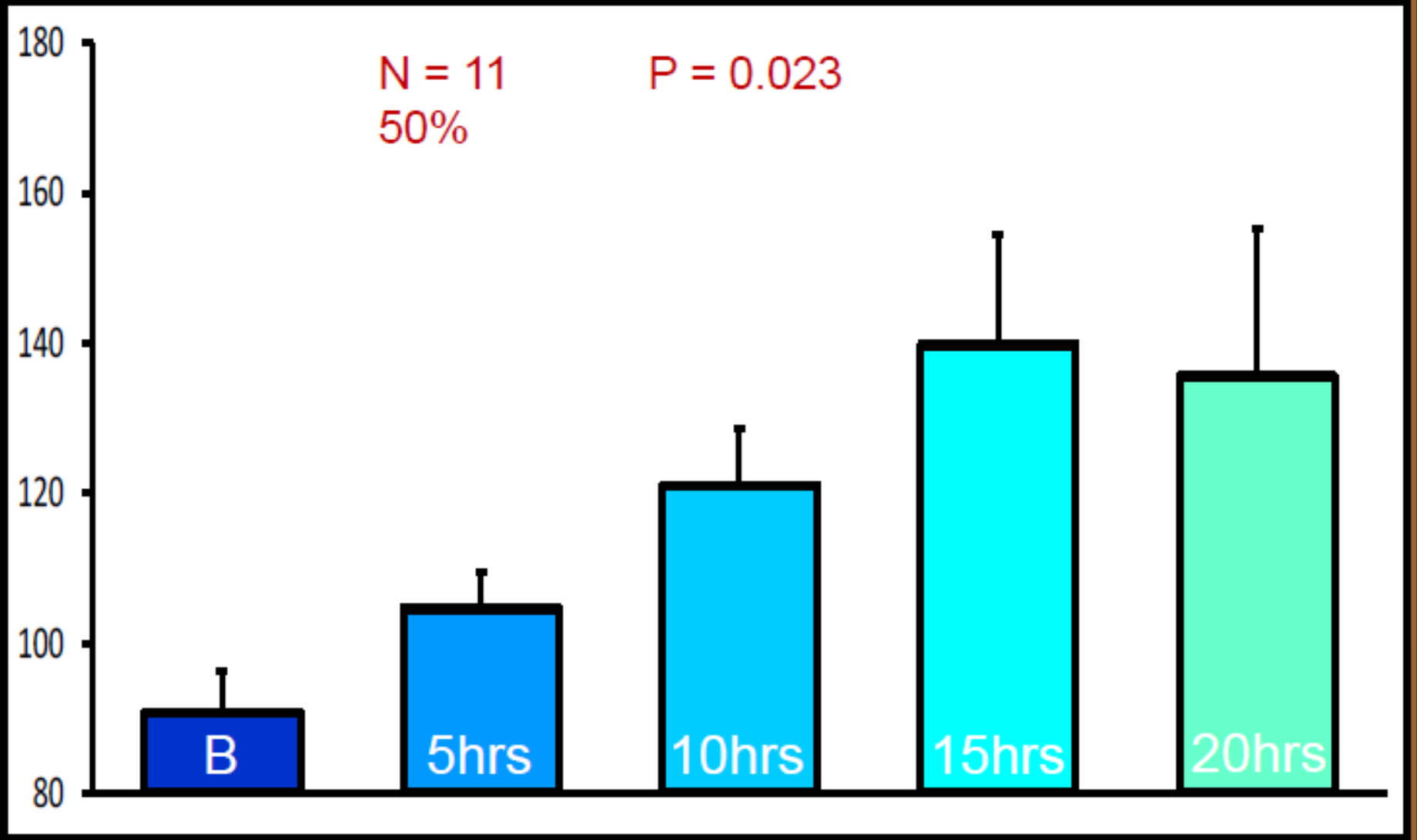
Rehabilitation site
http://www.readright.ucl.ac.uk/



Demo: therapy



Results after 20 hours of therapy



Evidence for management of visual problems in stroke

- 87 patients recruited with heminanopia within week 2 and month 6 of stroke
- Randomly assigned to:
  - Prisms
  - Visual search training
  - Information only (control)
  - Outcomes of visual field assessments and quality of life measured at week 6, 12, 26

Rowe et al *BMJ Open* 2014 & *Neuro-Ophthalmology* 2016

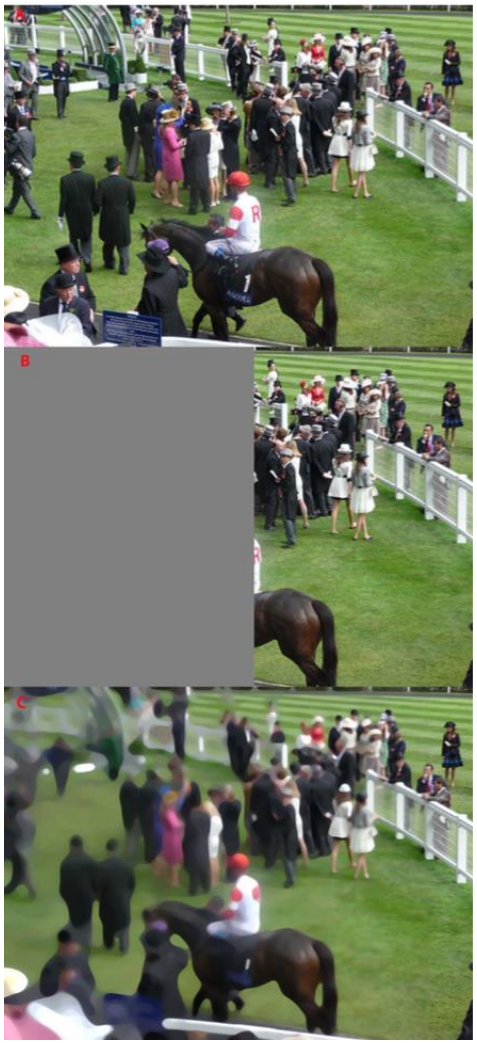
Evidence for management of visual problems in stroke

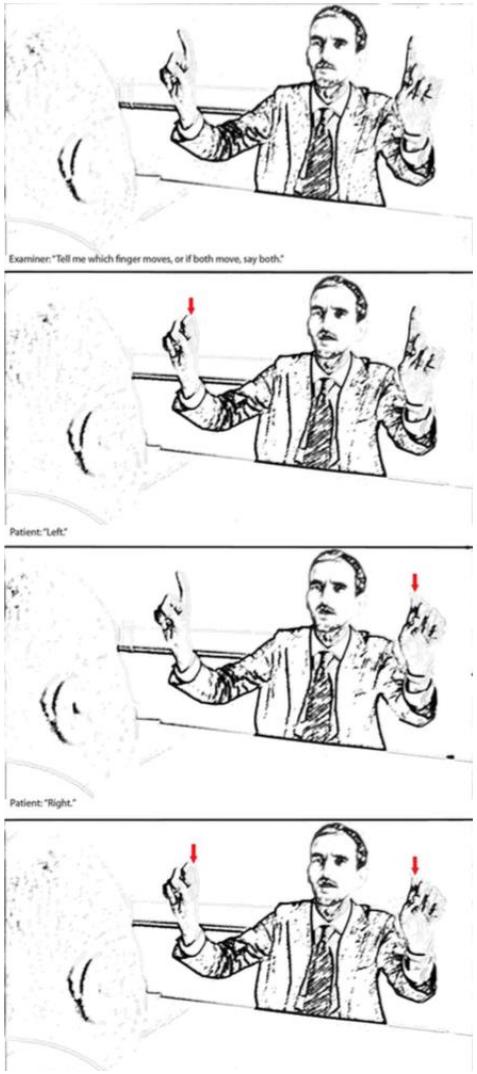
Results

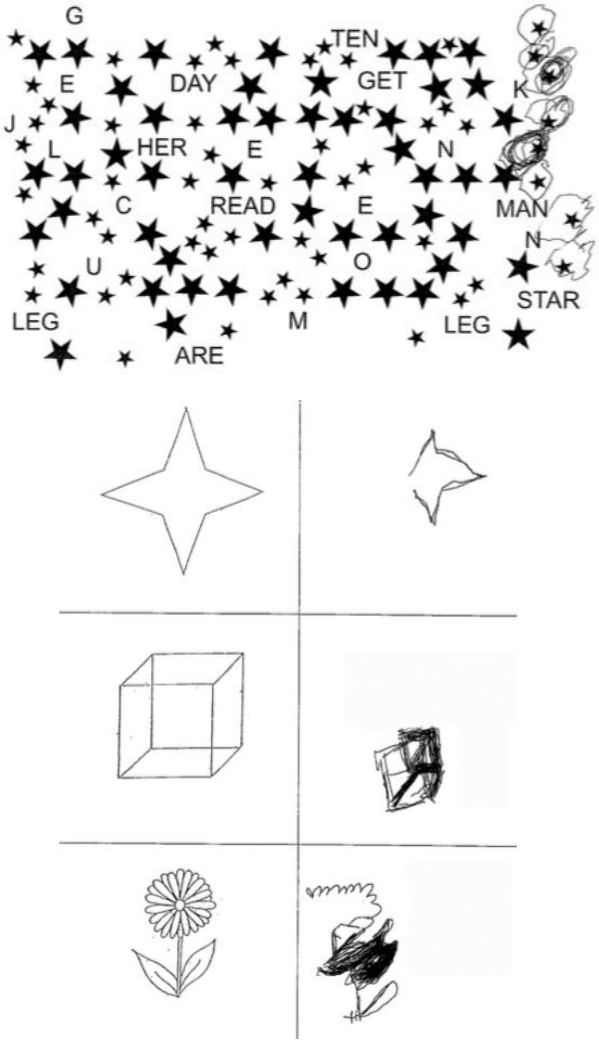
	Visual search training	Fresnel Prisms	Standard care	P value
Relative change in visual field	8%	5%	4%	0.55
Change in visual function	60 → 68	68 → 68	64 → 60	0.05
Adverse events	7%	69%	0%	

Rowe et al *Acta Neurologica Scandinavica* 2016

Perceptual Deficit - Visual Neglect

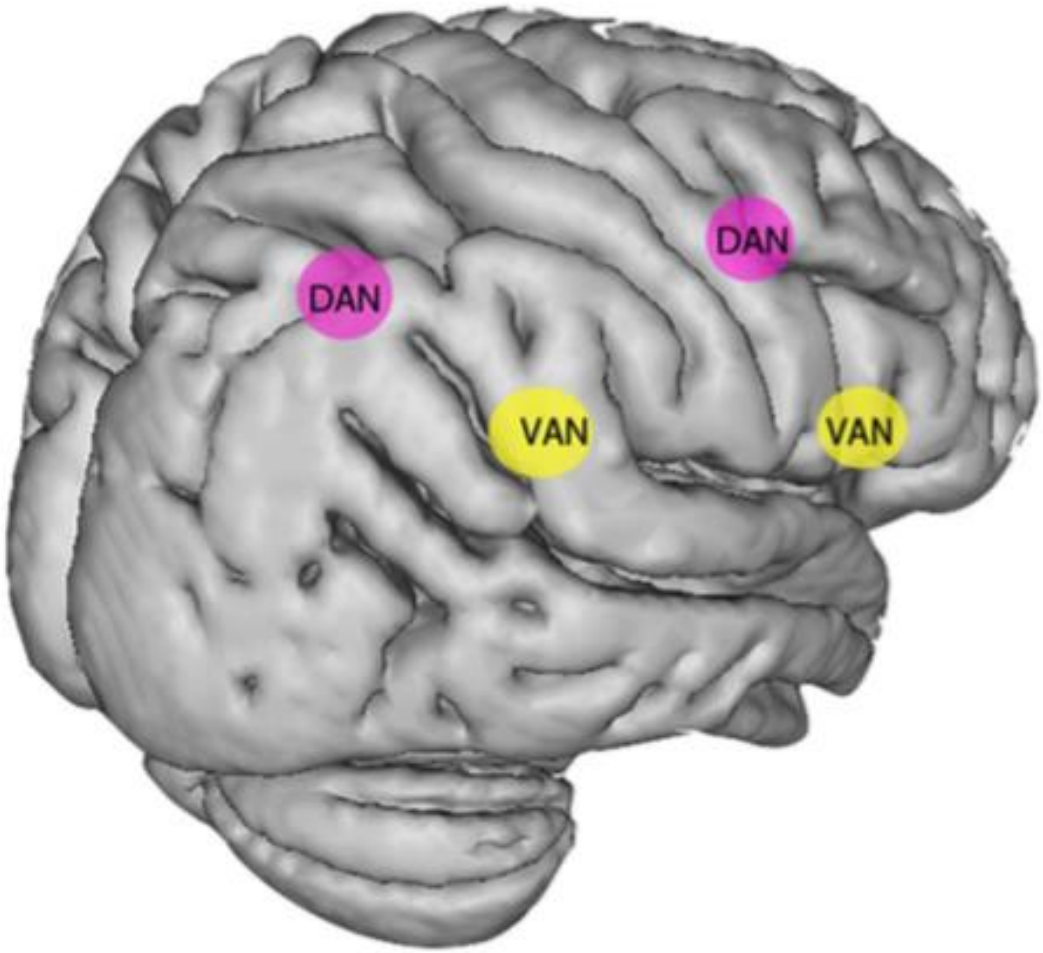






Li & Malhotra *Practical Neurology* 2015

Visual Neglect



Li & Malhotra *Practical Neurology* 2015

Management of visual neglect

- Scanning strategies
- Compensatory head postures
- Awareness

No consensus

Li & Malhotra *Practical Neurology* 2015

Visual rehabilitation

- Orthoptist
- Eye clinic liaison officer

RNIB
supporting blind and partially sighted people

Action for blind people

Improving detection and management of visual symptoms after stroke - an audit

Akın Nihat[1], Jayesh Khistria[2], Lucy Reynolds[1], Arani Nitkunan[1]

[1]St. George's Hospital, London, [2]Moorfields Eye Centre at St. George's Hospital

Visual problems in stroke

1.Visual field defect: 20%

2.Visual neglect: 65-82% (hemispheric stroke)

3.Diplopia: 40%

•Adversely affects activities of daily living, rehabilitation and mood (Rowe 2014)

Recommendations

Department of Health National Stroke Strategy:

- Vision post-stroke requires specific rehabilitation and support

British & Irish Orthoptics Society:

- Refer all patients with visual symptoms in the immediate post-acute phase

Preceding audit

Retrospective 2-week audit of local orthoptics referrals in unselected Hyper-acute Stroke Unit patients (n = 26), **October 2013.**

62% had visual symptoms
6% of these referred for orthoptist assessment
25% of these had documented MDT measures to aid vision

Intervention

1.Joint screening/referral form
2.Added to weekly multidisciplinary team meeting on Acute Stroke Unit

Intervention Aims

1.Improve detection/documentation of visual symptoms
2.Increase number of appropriate referrals to local orthoptics service

Results

Retrospective 1 month audit of local orthoptics referrals in unselected Acute Stroke Unit patients (n = 55), **December 2014.**

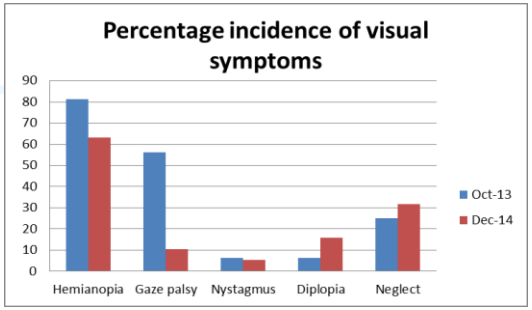


Fig 2: Inter-audit comparison of patients with visual symptoms

50% of patients referred required intervention (visual aids, prisms, community support)

Results

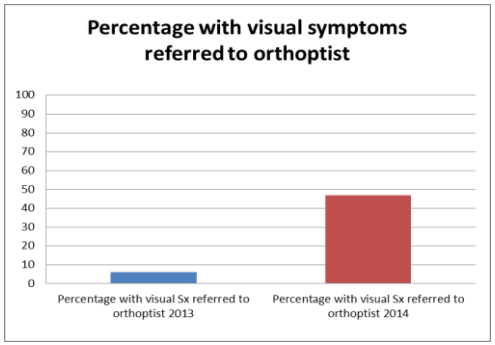


Fig 1: Inter-audit comparison of patient with visual symptoms referred to orthoptics service

Discussion & Future work

•Screening/referral form was completed exclusively by doctors

•The referral process has now been changed to allow any allied health professional to complete the referral, to increase uptake (Pollock 2011)

•Continue education to multi-disciplinary team about referrals for visual symptoms post-stroke

References

1.Department of Health. National stroke strategy. London: DH, December 2007
2.Jones, S.A., Shinton, R.A., 2006. Age Ageing
3.NICE. Stroke rehabilitation: the rehabilitation and support of stroke patients. July 2011
4.Pollock, A. et al., 2011.
5.Rowe, F.J., et al, BMJ 2014

Intervention

- Appointed an orthoptist in January 2017

Impact of a dedicated orthoptist to our Acute Stroke Unit at St. George's Hospital

Authors:
Nadia Venturi,
Andrea Priyanka Perera,
Arani Nitkunan

BACKGROUND

The 2016 stroke national clinical guidelines[1] emphasised the importance of orthoptic assessment for patients presenting to Acute Stroke Units (ASUs) at St George's, London, UK. The orthoptic society[2] recommends orthoptic review within the acute admission. A local audit in 2014[3] showed 48% of patients with a visual problem saw an orthoptist.

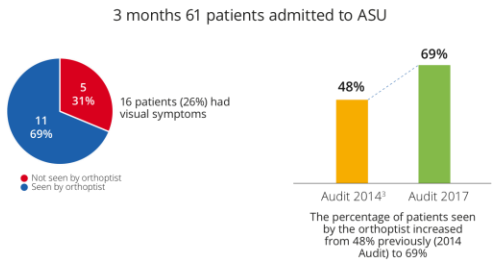
METHODS

Stroke orthoptist (part time – 2 sessions in a week) appointed January 2017. Role of orthoptist: assessed all referrals from the multidisciplinary team on the ASU for patients with a visual deficit. 18/09/17 – 21/12/17 (3 months) data collected on:

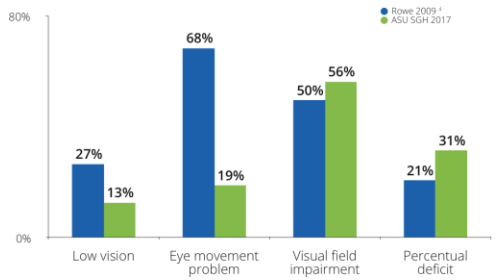
- Number of patients who saw orthoptist.
- All patients on ASU issued simplified VFQ-25 questionnaire to examine the difference an orthoptic assessment made to patients' visual quality of life.

RESULTS

Review of notes

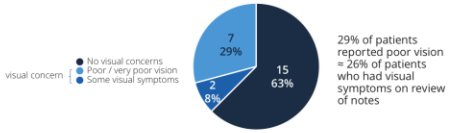


Review of notes



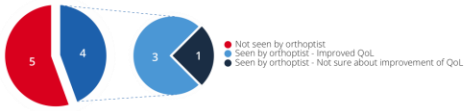
Questionnaire

24 questionnaires were returned (39% response rate)



Questionnaire (impact of seeing orthopist)

9 patients who returned questionnaires reported visual concern



CONCLUSIONS

Appointing a stroke orthoptist has had a significant positive impact on the visual symptoms of stroke patients – almost 70% are now seen and 75% of those seen feel that their quality of life has been impacted on positively by this encounter. 4 out of 9 patients reporting visual concerns via questionnaire were seen by the orthoptist (note that 29% of patients reported poor vision ≈ 26% of patients who had visual symptoms on review of notes):

- Did some patient see the orthoptist but wrongly answered the questionnaire?
- Under-detection and under-acknowledgement:
  - Did the stroke team reckon the orthoptist assessment was not required?
  - Did some patient fail to report their visual concerns to the stroke team?
  - Did the stroke team fail to refer the patient to the orthoptist?

Neglect is the symptom not seen by orthoptist. Little evidence that orthoptist's advice would be effective.

Limitations - small sample size, low response rate for questionnaire

[1] Royal Collage of Physicians, National clinical guidelines for stroke, October 2016
[2] BIOS, BIOS position statement for visual services in stroke practice, 2014
[3] Akin Nihat, Jayesh Khistria, Lucy Reynolds, Arani Nitkunan, Improving detection and management of visual symptoms after stroke – an audit, 2014
[4] Rowe, Brand, Jackson et al. Visual impairment following stroke: do stroke patients require vision assessment? Age and Ageing 2009

St George's University Hospitals NHS
NHS Foundation Trust

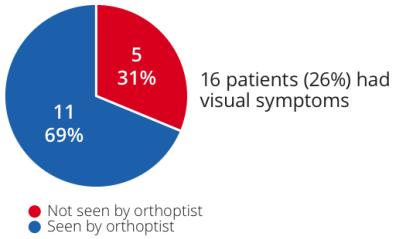
Moorfields Eye Hospital NHS
NHS Foundation Trust

ESOC 2018

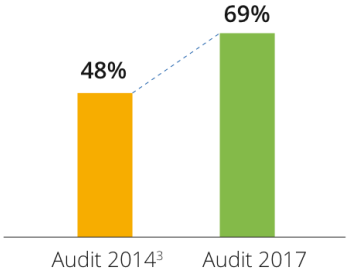
RESULTS

Review of notes

3 months 61 patients admitted to ASU

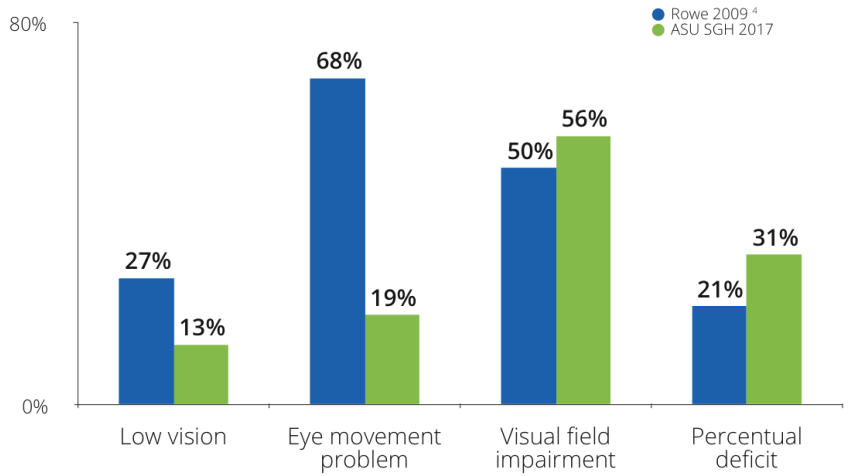


16 patients (26%) had visual symptoms



The percentage of patients seen by the orthoptist increased from 48% previously (2014 Audit) to 69%

Review of notes



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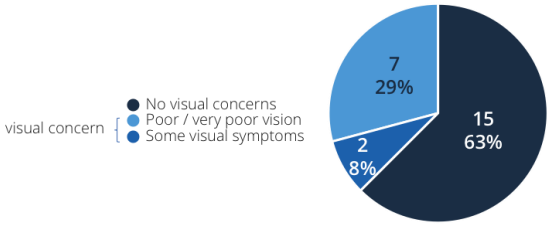
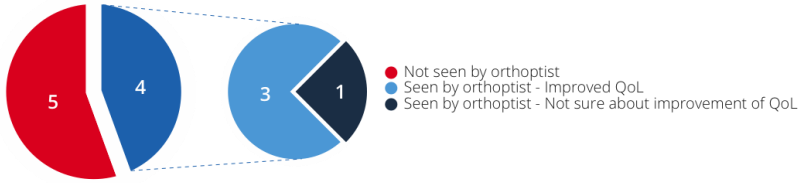


29% of patients reported poor vision ≈ 26% of patients who had visual symptoms on review of notes

Questionnaire (impact of seeing orthopist)

9 patients who returned questionnaires reported visual concern



ESOC 2018

Take Home Message

Increased awareness of visual problems in stroke

Questions?

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