City Research Online

City St George's, University of London

Citation: Wilson, C. M., Thomson, W. & D'Ath, P. (2013). Seeing you through London 2012: eye care at the Paralympics. British Journal of Sports Medicine, 47(13), pp. 869-872. doi: 10.1136/bjsports-2013-092614

This is the accepted version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/5550/

Link to published version: https://doi.org/10.1136/bjsports-2013-092614

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to City Research Online policy.

City Research Online: http://openaccess.city.ac.uk/ publications@citystgeorges.ac.uk

British Journal of
SPORTS MEDICINE

Seeing you through London 2012: eye care at the Paralympics

Journal:	*British Journal of Sports Medicine*
Manuscript ID:	Draft
Article Type:	Short Report
Date Submitted by the Author:	n/a
Complete List of Authors:	Wilson, Clare; UCL Institute of Ophthalmology, Department of Visual Neuroscience Thomson, W; City University London, Optometry and Visual Science D'Ath, Penny; City University London, Optometry and Visual Science
Keywords:	Olympics, Optometry

Confidential: For Review Only

SCHOLARONE™
Manuscripts

Seeing you through London 2012: eye care at the Paralympics

Dr. Clare M Wilson – NIHR Academic Clinical Lecturer in Ophthalmology, Department of Visual Neuroscience, UCL Institute of Ophthalmology, 11-43 Bath Street, London, EC1V 9EL, United Kingdom

Prof. W David Thomson – Prof of Optometry and Visual Science, Division of Optometry & Visual Science, City University London, Northampton Sq uare, London, EC1V 0HB, United Kingdom

Dr. Penny J D'Ath – Lecturer in Optometry, Division of Optometry & Visual Science, City University London, Northampton Square, London, EC1V 0HB, United Kingdom

Key words: Optometry, Eye care, Olympics, London 2012, Ophthalmology

Author for Correspondence

Dr. Clare M Wilson – NIHR Academic Clinical Lecturer in Ophthalmology, Department of Visual Neuroscience, UCL Institute of Ophthalmology, 11-43 Bath Street, London, EC1V 9EL, United Kingdom

Email: clarewil25@yahoo.com

Word count = 1,400

Abstract = 247

Confidential: For Review Only

"What are the new findings"
• A total of 870 competitors and support staff from 102 countries attended the eye clinic at London 2012 over a period of 22 days. • There were no serious ocular injuries during the Paralympic Games although seven patients were referred to the hospital eye service for conditions that required immediate attention (Stevens Johnson Syndrome, spontaneous retinal detachment, macula oedema and retinal haemorrhages, corneal ulcer, retinal haemorrhage, exudative macular degeneration and a private referral for chronic bilateral epiphora) and one patient was admitted as an inpatient with orbital cellulitis. • The majority of patients attended the clinic to have their refractive status checked, and a total of 749 pairs of spectacles, 14 pairs of contact lenses and seven low vision aids were dispensed.

"How might it impact on clinical practice in the near future"
• Patients seen at the Eye Care Clinic had more complex optometric and ophthalmological needs (e.g. Stevens Johnson Syndrome, orbital cellulitis, nystagmus, rod cone dystrophies, retinoblastoma, congenital cataracts etc) than those found during the Olympic Games. • For this reason, we suggest a full service should be run with four optometrists, two dispensing opticians and one ophthalmologist available throughout the Paralympic Games period. • It would have been beneficial to have had ophthalmologists on-site for longer periods of the day and for the entirety of the Paralympic Games period because of the complexity of ophthalmic complaints.

Confidential: For Review Only

ABSTRACT

Background

The provision of eye care services for competitors and support teams is integral to the modern Olympic Games. The eye clinic for the London 2012 Paralympic Games employed a multi-disciplinary team of eye care professionals using state-of-the-art instrumentation to provide the highest level of eye care. Full details of the organisation of the eye care clinic at London 2012 is described in a companion paper which summarises the eye care clinic during the London 2012 Olympic Games. These two reports will aid planning eye care clinics at future Games.

Aim

We aim to provide a summary of the organisation of the eye clinic and outline audit data relating to the eye conditions encountered during the Paralympic Games.

Results

A total of 870 patients representing 102 countries attended the eye clinic. 274 (31.5%) were competitors, the remainder were trainers and support staff. No serious ocular injuries resulted from competitor injury in the field of play during the Paralympic Games. Seven patients were referred urgently to hospital eye services (Stevens Johnson Syndrome, spontaneous retinal detachment, macula oedema and retinal haemorrhages, corneal ulcer, retinal haemorrhage, exudative macular degeneration and a private referral for chronic bilateral epiphora). One patient was admitted as an inpatient with orbital cellulitis. A total of 749 spectacles, 14 contact lenses and seven low vision aids were dispensed.

Conclusions

By combining excellent facilities and equipment with a multi-disciplinary team of eye care professionals, we feel we provided the highest level of eye care, providing a legacy for future Games.

Confidential: For Review Only

INTRODUCTION

Since the first modern Olympic Games held in Athens in 1896, the Olympic Charter has grown to include provision of many allied services for athletes and their support teams; one of which is the eye clinic. The Paralympic Games benefits from the same health care provision for its athletes and entourage.

At the London 2012 Paralympics, 164 countries and over 4000 competitors competed[1] in front of sell-out crowds.

In 2009, one ophthalmologist and two optometrists were appointed (the authors CMW, WDT and PJD) to lead the eye care service. A literature search revealed little information published regarding eye care services at previous Paralympic Games although a small, but useful, amount of information was obtained from personal communication from the Committee of the Paralympic Games.

Many systemic diseases have ocular complications[2]. Paralympians tend to have more complex ocular pathology than Olympians. Indeed, some competitors are eligible to compete as Paralympians due solely to visual impairment. Paralympians not competing in visually impairment categories may also have ocular conditions related to their underlying systemic condition. For example, those with cerebral palsy may have cerebral visual impairment, those with multiple sclerosis may have optic neuropathy and competitors with polio may have ocular motility disturbance. As many of the support team were former Paralympians, these patients also had more complex ocular needs for the same reasons. An unpublished report from Sydney stated that many patients seen during the Paralympics had a range of eye conditions varying from “optic neuritis secondary to malaria, sickle-cell retinopathy, and a number of patients with corneal conditions caused by birth trauma or infantile infections” [3] resulting in a “higher level of ophthalmic complexity” than found during the Olympic Games[4].

The Sydney eye clinic had three consulting rooms one of which was “wheelchair friendly”. The clinic ran for a period of 22 days and was staffed by 13 optometrists[3]. A total of 457 patients were seen with 57% prescribed spectacles and 19% fitted/refitted with contact lenses (including therapeutic lenses). In Athens, eye care

Confidential: For Review Only

accounted for 8% of all medical encounters[4].

Based on figures from the London 2012 Paralympics, around 18% of athletes are competing with visual impairments[5]. Visual impairment categories exist for the following sports: athletics, cycling, equestrian, football 5-a-side, goalball, judo, rowing, sailing and swimming[6].

Aim

This paper aims to provide outline audit data relating to the patients attending the eye clinic during the 22 days of Paralympic Games.

METHODS

We have assimilated data on the usage of the eye care clinic at London 2012 with reference to demographics, reason for attendance, injuries among competitors and spectacles dispensed.

Layout, equipment and staffing

As described in detail in our companion paper[7], the eye clinic formed part of a purpose-built polyclinic situated in the Athletes' Village and was designed to accommodate both competitors and their support teams. Details of room sizes, equipment, diagnostic drugs and volunteers are listed in this paper. The main findings from the Olympic Games were that 1,406 patients from 154 countries were seen. No serious eye injuries or referrals occurred, but a number of eye diseases including glaucoma, diabetic retinopathy and macular degeneration were detected. Patients predominantly attended the clinic for a full refractive status check and 973 pairs of spectacles and 50 pairs of contact lenses were dispensed[7].

Of the 309 optometrists and 103 dispensing opticians who applied to become Games Makers, 104 optometrists and 53 dispensing opticians were shortlisted of whom eight optometrists and six dispensing opticians were selected for the Paralympic Games.

Confidential: For Review Only

Six ophthalmologists were appointed as “Specialists” for eight days of the Paralympic Games period and were not subject to the normal Games Maker recruitment process.

The eye clinic was open for 22 days from 0700 to 2315 hours throughout the Paralympics Games period. Predicted staff numbers required throughout the Games period are shown in figure 1.

FIGURE 1 – Predicted staff numbers required throughout Games period

Results

Audit of patients seen

A total of 870 patients representing 102 countries attended the eye clinic over the period of the Paralympic Games. Of these, almost one third were competitors (n=274; 31.5%), and 596 (68.5%) comprised of members of the support team.

Table 1 shows the demographic characteristics of patients who presented to the clinic.

Confidential: For Review Only

TABLE 1 – Demographic characteristics

Paralympics

Characteristic	Competitors	Non-competitors
N (%)	274 (31.5%)	596 (68.5%)
Male:Female	170:104	445:151
Age (Mean: Range: n)	M: 33.9 : (18-56) : n=170 F: 32.7 : (17-51) : n=104	M: 49.7 : (19-75) : n=445 F: 45.6 : (19-79) : n=151

Figure 2 shows the number of patients attending the clinic on each day throughout the period of the Paralympic Games. The maximum number of patients examined in one day occurred on Day 5 of the competition when 76 patients were seen.

FIGURE 2 – Number of patients per day

The peak times that competitors attended the clinic was 11am and 3pm and, for non-competitors, was 11am, 3pm and 9pm. (see figure 3).

FIGURE 3 – Percentage of patients by time of day

Almost 40% of patients complained of “reduced vision” (competitor (38%) and non-competitor (40%)). Among the non-competitors, 59% of cases of reduced vision related to problems with reading / near vision. A total of 14% of the competitors and 10% of the non-competitors were asymptomatic and attended for a routine eye examination. Non-competitors (35%) were three times more likely to present requiring replacement spectacles compared to competitors (12%). There were four minor ocular injuries that required specialist eye care one of which was a mild thermal injury caused by debris from fireworks at the Opening Ceremony.

TABLE 2 – Reason for visit

Characteristic	Competitors N = 196	Non-competitors N = 419
Reduced vision:	75 (38.3%) • 31	167 (39.9%) • 32

Confidential: For Review Only

• Distance vision • Near vision • Distance and near vision • Not specified	• 30 • 13 • 1	• 98 • 35 • 2
Routine eye examination	27 (13.8%)	43 (10.3%)
Replacement spectacles (Lost / broken / left at home)	24 (12.2%)	145 (34.6%)

Of the 870 patients who attended the clinic, 14 (2%) had contact lens related issues or required new lenses (one required a cosmetic glass design) and approximately 72 (8%) were referred for an ophthalmological opinion. Ophthalmologists saw between 6 and12 patients per day over a period of eight days. Only eight days were covered as ophthalmologist cover was organised by linking to predicted demand. The majority of patients required a single visit to the clinic (excluding the collection of spectacles). Exceptions were patients with contact lens issues or those with conditions requiring ophthalmological management who had up to four follow-up visits.

There were 749 pairs of spectacles and seven low vision aids dispensed with seven patients (1%) reporting non-tolerance to their new spectacles. Spectacle type was determined for all 749 pairs (see table 3).

TABLE 3 – Spectacles prescribed

Type of spectacles	N = 662 (%)
Distance vision	361 (47.8%)
Near vision	312 (41.3%)
Varifocals	60 (7.9%)
Bifocals	16 (2.2%)
Magnifiers	6 (0.8%)

Confidential: For Review Only

Table 4 shows the number of ocular conditions by visual impairment classifications/ sport. Of the 38 cases of visual impairment, eight (21%) were caused by high myopia and five (13%) were caused by congenital nystagmus.

There were seven referrals to hospital eye services for Stevens Johnson Syndrome, spontaneous retinal detachment, macula oedema and retinal haemorrhages, corneal ulcer, retinal haemorrhage and exudative macular degeneration. One patient was admitted to hospital for treatment of orbital cellulitis. There was also one private referral for chronic bilateral epiphora.

TABLE 4 – Ocular condition by visual impairment classifications

Sport	Classi-fication	M	Condition	F	Condition
Goalball (all players blindfolded to ensure fairness)		**N = 3**		**N = 3**	
	Unknown			1	
Blind	**B1**	1	• prosthetic eye		
Visually impaired / partially sighted	**B2**	2	• optic neuropathy • glaucoma and nystagmus	2	• rod cone dystrophy • bilateral optic atrophy
5 a side football		**N = 1**			
Visual impairment		1			
Cycling		**N = 1**			
Visual impairment	B	1	• retinitis pigmentosa		
Judo		**N = 3**		**N = 2**	
Blind	B1	1	• retinitis pigmentosa with macular dystrophy		
Visually impaired / partially sighted	B2	1	• poor vision since childhood (-6D)	1	
Visually impaired / partially sighted (higher number = better vision)	B3	1	• myopia and astigmatism (-6D)	1	• high myopia (>-20D)
Rowing		**N = 1**		**N = 2**	
	LTA-VIB2	1	• high hyperopia (+13D)	1	• congenital nystagmus

Confidential: For Review Only

	LTA-VIB3			1	• congenital glaucoma
Swimming		**N = 1**			
Visual impairment	S12	1	• congenital nystagmus		
Field sports		**N = 9**		**N = 2**	
Visual impairment	F12	3	• congenital nystagmus • retinal detachment LE and high myopia (-9D)	2	• congenital cataracts • high myopia (-12D)
Visual impairment	F13	6	• RTA, one blind eye • bad fall as child, high myopia (-21D) • retinoblastoma • bilateral congenital optic disc atrophy and nystagmus • congenital blindness		
Track		**N = 5**		**N = 5**	
Visual impairment	T11	1	• AION aged 21	1	• poor vision since measles aged 3
Visual impairment	T11/T12			1	• end stage POAG
Visual impairment	T12	1		2	• congenital cataracts • microphthal-mos and nystagmus
Visual impairment	T13	3	• 3 x high myope (-10D, -12D, -16D)	1	• ? glaucoma
TOTAL		24		14	

Of the non-competitors, the commonest reasons for referral to the ophthalmologist were glaucoma (n=5), ocular complications of diabetes (n=3), conjunctivitis (viral and bacterial: n=2) and other more unusual pathologies such as Leber's Congenital Amaurosis. In cases that required long-term care in the patient's own country, a letter with the findings and appropriate images from the OCT or visual field analyser were given to the patient in CD ROM format.

Patients had more complex optometric and ophthalmological needs (e.g. Stevens Johnson Syndrome, Leber's Congenital Amaurosis, orbital cellulitis, nystagmus, rod cone dystrophies, retinoblastoma, congenital cataracts etc) than those found during

Confidential: For Review Only

the Olympic Games.

No adaptations were made to the clinic from the Olympic Games, perhaps as the set up had been designed with provisions for Paralympic athletes in mind. All wheelchair patients transferred themselves to the main consulting room chair. We recommend that a full service should be run at future Paralympics with four optometrists, two dispensing opticians and one ophthalmologist available throughout the Games period.

Summary

A total of 870 patients from 102 countries attended the eye clinic over a period of 22 days; almost double the number seen (90% increase) at the Sydney Paralympics over an identical period of 22 days. Of these, 274 attendees were competitors and the remainder were trainers and support staff.

Demand for the service increased from the day that the teams arrived reaching a peak of 76 on day five of the competition. Most patients were managed by optometrists with support from dispensing opticians. Ophthalmologists provided specialist care as needed.

A total of 749 pairs of spectacles were dispensed. Just over 50% of were prescribed for near vision /reading. This was significantly more than at Sydney 2000 where 261 pairs of spectacles were dispensed. Fourteen contact lenses / therapeutic lenses were fitted and seven low vision devices were issued.

No major ocular injuries occurred from sports although seven patients required further referral to the hospital eye service and one required hospital admission.

Our aim was to provide competitors and their support teams with the highest level of eye care. We believe we achieved this aim and provided a legacy of eye care for future Paralympic Games to build on.

REFERENCES

Confidential: For Review Only

1. Willick SE, Webborn N, Emery C et al. The epidemiology of injuries at the London 2012 Paralympic Games. *Br J Sports Med* 2013; **47(7)**; pp426-432
2. Mohsenin A and Huang JJ. Ocular manifestations of systemic inflammatory diseases. *Conn Med*. 2012 Oct; **76(9)**; 533-544
3. Personal communication from LOCOG. Unpublished report "Eye Service Sydney"
4. Personal communication from LOCOG. Unpublished report "UPDATED – Service Specification – Optometry"
5. Figure calculated from 'London 2012 Paralympic athletes: the full list of competitors and disciplines'. The Guardian. http://www.guardian.co.uk/news/datablog/2012/aug/30/every-paralympic-athlete-and-their-sport-data (Accessed 7th May 2013).
6. http://www.paralympic.org/sites/default/files/document/120716152047682_ClassificationGuide_2.pdf (Accessed 7th May 2013)
7. D'Ath PJ, Thomson WD and Wilson CM. Seeing you through London 2012: eye care at the Olympics. *Br J Sports Med* 2013; **47(7)**; pp463-466

ACKNOWLEDGEMENTS

The authors would like to express their thanks to the volunteers of the London 2012 eye clinic:

Caroline Christie (Contact Lens Coordinator),

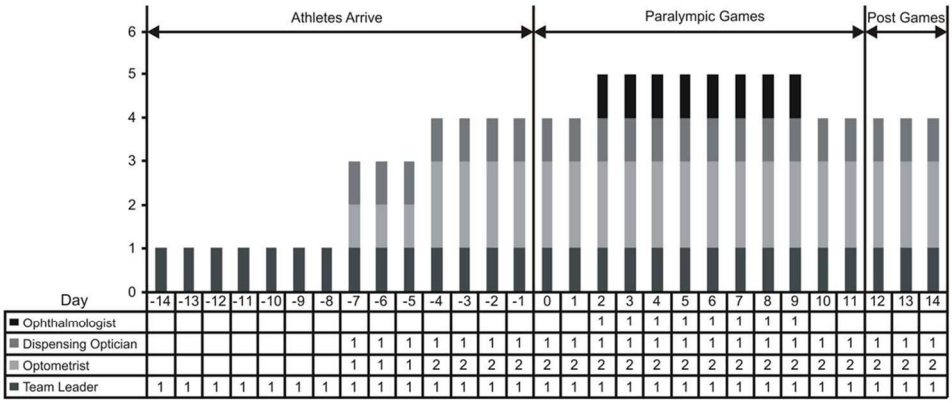
Katherine Anguige, Nathanael Anguige, Robin Baker, Liz Baron, David Bennett, Susan Blakeney, Chris Boyde, Gillian Bruce, Niral Charadva, Oliver Comyn, Suzy Connolly, Shaun Crome, Ruth Cuthbert, Sue Daniel, Ruth Davies, Lee Davis, Helen Denton, Michelle Derbyshire, Julian de Silva, Tessa Fayers, Jessica Fielding, Susan Gibbons, Lucy Hall, Laura Hing, Fiona Hiscox, Byki Huntjens, Hari Jayaram, Margaret Lawrence, Jennifer Lee, Jake Low-Beer, Hamish MacDonald, Andrew Mace, Anthony Martin, Sara McCullough, Michael Offord, David Parkins, Sheetal Patel, Catherine Porter, Yasmin Riaz , Scott Robbie , Chris Roberts, Sally Rosedale, Claire Ruddock, Bharat Rughani, Anaeka Sodha, Karen Sparrow, Elaine Styles, Vanessa Uden , Ellen Watkins, James Wolffsohn, Karen Wong.

Confidential. For Review Only

Contributors CMW, WDT and PJD made a significant contribution to the conception and design of the eye clinic at London 2012, the collection and interpretation of data and the drafting and subsequent refinement of the paper. We confirm that all authors have approved the final version submitted.

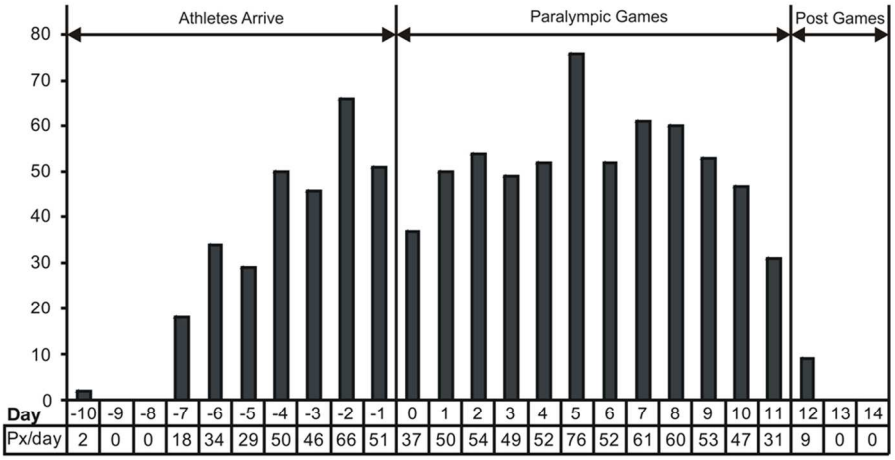
Competing interests: None.

Confidential: For Review Only



211x98mm (150 x 150 DPI)

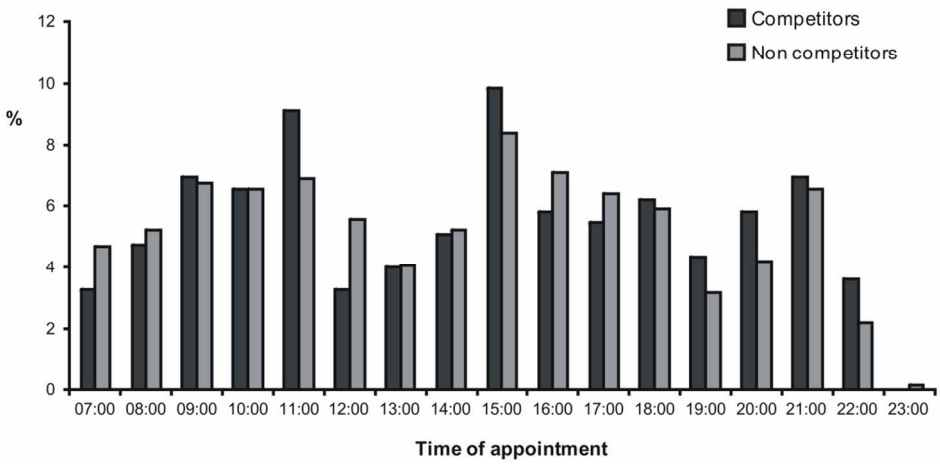
For Review Only



Day	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Px/day	2	0	0	18	34	29	50	46	66	51	37	50	54	49	52	76	52	61	60	53	47	31	9	0	0

211x112mm (150 x 150 DPI)

For Review Only



333x174mm (96 x 96 DPI)

For Review Only

Unable to Convert Image

The dimensions of this image (in pixels) are too large to be converted. For this image to convert, the total number of pixels (height x width) must be less than 40,000,000 (40 megapixels).

ential: For Review Only

Unable to Convert Image

The dimensions of this image (in pixels) are too large to be converted. For this image to convert, the total number of pixels (height x width) must be less than 40,000,000 (40 megapixels).

ential: For Review Only

Unable to Convert Image

The dimensions of this image (in pixels) are too large to be converted. For this image to convert, the total number of pixels (height x width) must be less than 40,000,000 (40 megapixels).

ential: For Review Only