

Emergency and urgent eye care facility at the Pan American and Parapan American Games



The Toronto 2015 Pan American (Pan Am) and Parapan American (Parapan Am) Games were held from July 10 to 26 and August 7 to 15, 2015, respectively.¹ An emergency and urgent eye care facility in conjunction with the Games Polyclinic and emergency medicine centre was established

to care for accredited athletes, coaches, trainers, team mission staff, and host volunteers. The purpose of this article is to describe the method of recruitment of ophthalmologists and optometrists to provide emergency and urgent eye care in the polyclinic and to describe the emergencies that were seen during the Pan Am and Parapan Am Games in 2015.

The games were held at venues in Toronto and 17 other Golden Horseshoe communities. The games involved 7740 athletes representing 41 countries in the Americas. This was the largest multisport event hosted in Canada in terms of athletes competing. There were 364 events held in 36 sports (Figs. 1 and 2). Previous Pan Am and Parapan



Fig. 1—Sporting events of the Pan Am Games 2015 (from www.toronto2015.org).

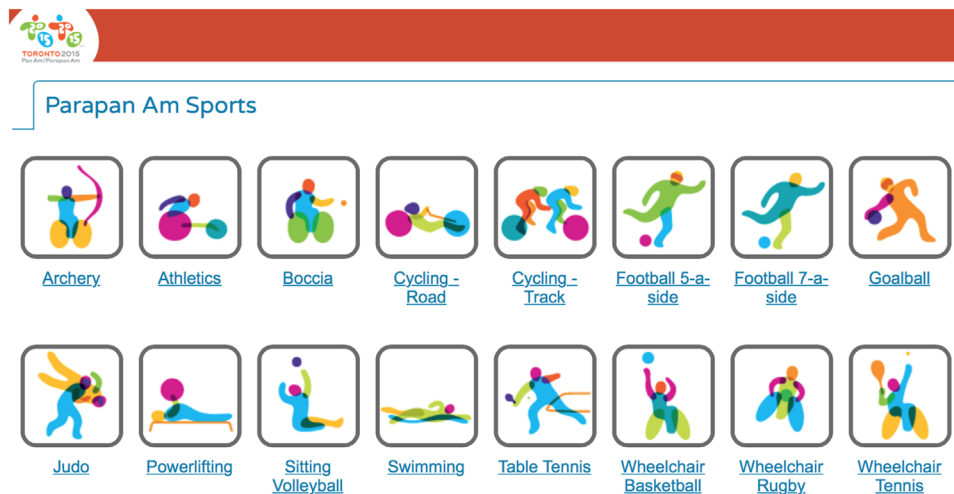


Fig. 2—Sporting events of the Parapan Am Games 2015 (from www.toronto2015.org).

Am Games were smaller in terms of number of athletes and events (Figs. 3 and 4). The Athletes' Village was established in the West Don Lands along Front Street between Bayview Avenue and Cherry Street.² The facility had the capacity to accommodate 10 000 athletes and officials. The competing athletes from 41 countries are broken down as shown in Table 1.

A polyclinic was established in the Athletes' Village that was a 20,000-square-foot portable building. It included a family practice clinic, a 23-hour short stay unit, and a fully

equipped 24-hour emergency room that met provincial standards to receive ambulance transfer of patients meeting Canadian Triage Acuity Score Level 3–5 criteria. Support services included diagnostic imaging (magnetic resonance imaging, x-ray imaging, and ultrasound), an onsite licensed laboratory, and a licensed pharmacy. Rehabilitation services included physiotherapy, chiropractic care, athletic therapy, massage therapy, and foot and hand clinics. Dentistry and ophthalmology were offered not only for injury and illness care but also for prevention given that many accredited

Year	Games	Host City	Host Nation	Nations	Athletes	Sports
1951	I	Buenos Aires	Argentina	21	2,513	18
1955	II	Mexico City	Mexico	22	2,583	17
1959	III	Chicago	United States	25	2,263	18
1963	IV	São Paulo	Brazil	22	1,665	19
1967	V	Winnipeg	Canada	29	2,361	18
1971	VI	Cali	Colombia	32	2,935	18
1975	VII	Mexico City	Mexico	33	3,146	18
1979	VIII	San Juan	Puerto Rico	34	3,700	22
1983	IX	Caracas	Venezuela	36	3,426	23
1987	X	Indianapolis	United States	38	4,453	30
1991	XI	Havana	Cuba	39	4,519	33
1995	XII	Mar del Plata	Argentina	42	5,144	34
1999	XIII	Winnipeg	Canada	42	5,083	35
2003	XIV	Santo Domingo	Dominican Republic	42	5,223	35
2007	XV	Rio de Janeiro	Brazil	42	5,633	34
2011	XVI	Guadalajara	Mexico	42	5,996	36
2015	XVII	Toronto	Canada	41	6,132	36

Fig. 3—Host cities, number of athletes, and events of the Pan Am Games 2015 (from en.wikipedia.org/wiki/Pan_American_Games#Participating_nations).

Year	Games	Host City	Country	Winner Nation
1999	I	Mexico City	 Mexico	 Mexico
2003	II	Mar del Plata	 Argentina	 Mexico
2007	III	Rio de Janeiro	 Brazil	 Brazil
2011	IV	Guadalajara	 Mexico	 Brazil
2015	V	Toronto	 Canada	 Brazil
2019	VI	Lima	 Peru	

Fig. 4—Host cities of the Parapan Am Games 2015 (from en.wikipedia.org/wiki/Parapan_American_Games).

persons did not have access to these services in their home countries. The polyclinic was staffed by volunteer Ontario licensed health care professionals including medical doctors, nurses, and pharmacists from across the province. The polyclinic opened for patient care on July 1, 2015, and continued to provide care through both games' periods and until August 21, 2015. The emergency room operated 24 hours a day and resulted in a significant reduction in local hospital emergency room visits from games-accredited persons.

Table 1—Countries that participated in the Pan Am Games/Parapan Am Games

Antigua and Barbuda
Argentina
Aruba
Bahamas
Barbados
Belize
Bermuda
Bolivia
Brazil
British Virgin Islands
Canada
Cayman Islands
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
El Salvador
Grenada
Guatemala
Guyana
Haiti
Honduras
Jamaica
Mexico
Nicaragua
Panama
Paraguay
Peru
Puerto Rico
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Suriname
Trinidad and Tobago
United States
Uruguay
Venezuela
Virgin Islands

Dr. Julia Alleyne was the chief medical officer (CMO) for the Toronto Pan American and Parapan American Games and was responsible for all games' medical services (venue medical clinics and the polyclinic), emergency ambulance and designated hospital services, public health services, and the antidoping program. Dr. Michael Easterbrook was the lead ophthalmologist responsible for establishing the protocols and services in the eye care facility. Dr. Raymond Stein and the staff at the Bochner Eye Institute were responsible for recruiting ophthalmologists and optometrists and providing care for the eye care daily operations.

Method

The goal was to establish an emergency and urgent eye care facility in the polyclinic located in the Athletes' Village. A space of 250 square feet was designated specifically for eye care. In this temporary building, the eye care space was equipped with a slit lamp, visual acuity projector, phoropter, visual field machine, lensometer, corneal burr drill, eye occluder including one with pinholes, sterile eye patches, fluorescein strips, and a wide range of ophthalmic drops including proparacaine, mydriacyl, cyclogel, glaucoma medications, and antibiotics. The ophthalmic equipment was sponsored through a games agreement with Innova, which provided equipment for both the classification testing for the Parapan Games and the polyclinic services for both games. The agreement included delivery, calibration, and maintenance of all equipment.

The Bochner Eye Institute negotiated an agreement with the Toronto Organizing Committee as a medical sponsor and was able to design a mixed model of clinical service with optometrists and ophthalmologists. Bochner Eye Institute provided the lead ophthalmic technicians who were their usual paid employees and integrated a roster of volunteer optometrists and ophthalmologists who were licensed in Ontario. The team of 3 Bochner technicians provided the onsite administrative management and assisted with clinical services for the duration of both games. In addition, a call was put out to recruit volunteer optometrists for daytime shifts from 8:00 AM to 6:00 PM for 7 days per week and ophthalmologists from 5:00 PM to 8:00 PM for 3 days per week. The shifts overlapped for 1 hour to accommodate for training and handover. Over 850 Ontario optometrists and 260 ophthalmologists were sent a recruitment email blast and asked to book online with acceptance on a first-come basis. In less than 2 hours, all the time slots were booked, which represented 618 man-hours of clinic work.

Bochner Eye Institute negotiated a sponsorship agreement with the Toronto Organizing Committee to provide optometry and ophthalmology services in exchange for recognition and ticket access. An additional sponsorship agreement was negotiated between the Toronto Organizing Committee and Loblaw's Optician services for the

provision of opticians as well as frames and lenses. Glasses could be obtained in a 2-day turnaround to accredited persons who required replacement or new glasses.

The role of the ophthalmologist was to examine patients referred by the optometrists from the day schedule or urgent trauma cases referred from the polyclinic emergency room or family practice services. The Canadian Medical Protective Association was consulted and worked with the CMO to design an express consent form that included the nongovernance clause for treating patients outside their country jurisdiction. Through discussions with the Local Health Integration Networks, 11 designated hospitals agreed to provide coverage for accredited persons requiring services such as surgery or multiple trauma care that were beyond the scope of the polyclinic. This included access to the hospital ophthalmologists for consultation and treatment when required. The cost of the services was covered under an independent insurance plan for games-accredited persons.

The games required approximately 17 000 volunteers, and the medical volunteers composed 2000 of that number. All volunteers were required to undergo a background security check as part of their accreditation process.³ This process was done by an independent security company, Contigo, in cooperation with the Royal Canadian Mounted Police. Individuals applying for a security clearance required either a passport or driver's licence and had to answer a series of background questions. Doctors, nurses, and ancillary staff that were cleared for work received a Pan Am or Parapan Am photo identification tag that allowed limited entry based on a specific date of work. Entry in to the Athletes' Village was controlled by a security team with metal detectors.

Results

Seventy-nine eye doctors volunteered 618 hours of eye care service to athletes, coaches, and trainers from 41 countries (Table 2). During the 6-week games period, a total of 572 patients were seen with emergencies secondary to trauma or medical conditions. In addition, persons who had lost or broken their glasses or had issues with contact lenses were provided with care.

During the Pan Am Games a total of 374 patients were seen from the following countries: Canada (5), Cuba (87), Venezuela (63), Puerto Rico (48), Dominican Republic (28), Trinidad & Tobago (22), Chile (18), Mexico (15), and 23 other countries with 88 patients. Fifty-seven athletes and 317 coaches, administrators, and others were

Table 2—Emergency and urgent care eye clinic	
Variable	Number
Ophthalmologists	16
Optometrists	63
Clinic hours worked	618
Total number of patients	572

Table 3—Pan Am Games: primary indication for visit to eye clinic	
Indication	Number of Visits
Updated refraction	312
Contact lens loss or problem	5
Dry eye	20
Allergic conjunctivitis	16
Blunt eye trauma	8
Glaucoma	4
Foreign body	2
Sty	2
Cataract	2
Blepharitis	1
Herpetic lesion	1

examined in the eye clinic. The main reasons for being seen are shown in Table 3. The number one indication was to update glasses, 83.4% of visits, as a total of 312 refractions were performed. There were 8 cases of blunt eye trauma that resulted in corneal abrasions and/or subconjunctival hemorrhages. There were 2 corneal foreign body injuries that were managed. There were no traumatic hyphemas, corneal lacerations, or intraocular penetrating injuries.

During the Parapan Am Games there were a total of 198 patients examined from Canada (3), U.S. (1), Colombia (46), Mexico (40), Venezuela (33), Cuba (16), Peru (11), and 16 other countries with 48 patients. There were 65 athletes and 133 coaches, administrators, or other personnel. Table 4 lists the main indication for visits to the eye clinic. The number one indication was to update glasses with a total of 159 patients, or 80.3% of visits. There were no cases in this group of blunt trauma or foreign bodies.

During both the Pan Am Games and Parapan Am Games all patients were managed in the eye clinic by the volunteer optometrists and ophthalmologists. There were no referrals to designated hospitals for surgical or advanced medical intervention.

Discussion

Ophthalmic coverage was established by volunteer ophthalmologists and optometrists for both the Pan Am

Table 4—Parapan Am Games: primary indication for visit to eye clinic	
Indication	Number of Visits
Updated refraction	159
Contact lens loss or problem	4
Dry eyes	13
Glaucoma	4
Sty	3
Eye infections	3
Allergic conjunctivitis	2
Blepharitis	2
Retinal scars	2
Floater	2
Cataract	1
Iritis	1
Optic nerve drusen	1
Stargardt disease	1

Table 5—Pan Am and Parapan Games 2015 versus London Olympic and Paralympic Games 2012

Variable	Pan Am Games 2015 (Toronto)	Parapan Games 2015 (Toronto)	Olympic Games 2012 (London)	Paralympic Games 2012 (London)
Total athletes	6132	1651	10 700	4302
Patient visits	374	198	1406	878
Spectacles	312 (83.4%)	159 (80.3%)	973 (69.2%)	749 (85.3%)
Contact lenses	5 (1.3%)	4 (2.0%)	50 (3.5%)	14 (1.5%)
Minor trauma	10 (2.6%)	0 (0%)	19 (1.3%)	0 (0%)
Major trauma	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Medical eye issues	46 (12.2%)	35 (17.6%)	364 (25.8%)	115 (13.0%)

and Parapan Am Games in Toronto from July 7 to August 17, 2015. The technique of emailing potential doctor volunteers and a signup using an online scheduling program was very successful in filling 618 hours of work in just a few hours. The use of an ophthalmic assistant in the clinic each day provided a general orientation to the polyclinic and specific support in the eye clinic to both the ophthalmologists and optometrists.

Complimentary glasses were provided by Loblaw's Optical. This was a valuable service especially in the case of broken or lost glasses. In tradition with Olympic values and service, accredited persons requiring glasses for general health were provided with this service as many reside in countries less fortunate than ours and do not have access to regular glasses provision.

Most clinic visits were for refractions or nontraumatic medical conditions and were easily managed by the optometrists and ophthalmologists. Traumatic cases were limited to blunt trauma and foreign body injuries. There was no serious trauma or medical case that required surgical intervention in community hospitals.

In general, the volunteer doctors enjoyed participating in the eye clinic and meeting athletes and coaches from different countries in the Americas. Especially notable were athletes with visual disabilities that participated in the Parapan Am Games and were able to excel despite their limitations.

At major sporting events, there are few published reports on the establishment of eye care facilities, recruitment of doctors and staff, number of patient visits, and types of emergencies. This is the first report on emergency eye care for a major sporting event in Canada and for the Pan Am or Parapan Games. Unlike the Pan Am and Parapan Games, the Olympic Games are significantly larger in terms of the number of total participants.

In the Sydney Olympic Games in 2000, there were a total of 1873 patients for eye care visits, accounting for 13% of all medical visits.⁴ Similar to the experience in Toronto, in Sydney a high percentage of visits were for glasses (44% or 838 visits) and contact lenses (2.8% or 153 visits). Communication with Olympic Committee members on the Athens Olympic Games in 2004 and research published by D'Ath et al.⁵ has provided some eye care data. During the Athens games, 8% of the total medical visits were eye related with a report of 911 injuries.⁵ Unfortunately, there are no published statistics on the breakdown of these injuries. At the Beijing

Olympics in 2008, over 750 spectacles were prescribed. Eye injuries in Beijing were grouped under the category of ear, nose, and throat, with a total of 3507 or 16% of the medical visits.⁶

Statistics are available from the Olympic Games and Paralympics in London in 2012,^{5,7} which took place over a 30-day period. A comparative analysis of the eye care at the 2012 Olympic and Paralympic Games versus the Pan Am and Parapan Games is presented in Table 5. In the 2012 Olympic Games, there were a total of 1406 patients; 973 visits were for updated glasses (69.2%) and 50 for either new contact lenses or issues related to contact lens wear (3.5%). There were no major eye injuries that required further referral. As predicted, most of the minor ocular traumas occurred in contact sports. In the Paralympics there were a total of 870 patients. A total of 749 patients were seen for glasses, 14 for contact lenses, and 7 for low vision aids. In this group, there were no serious ocular injuries; however, 7 patients were referred to hospital eye services for retinal detachment, orbital cellulitis, corneal ulcer, macular edema, or Stevens-Johnson syndrome.

The eye staffing model for the London Olympic Games and Paralympic Games in 2012 was similar to our eye clinic with volunteer services provided by ophthalmologists, optometrists, and opticians. In the London Olympics the volunteer eye care professionals worked more shifts, and therefore fewer providers were required. The total number of eye care providers was 9 ophthalmologists, 16 optometrists, and 10 dispensing opticians. This care was organized through a Games Maker volunteer program, the details of which were not described. The recruitment of eye care professionals at the Pan Am and Parapan Games was by invitation and an online registration.

Conclusion

The establishment of an onsite volunteer eye clinic involving ophthalmologists, optometrists, and opticians can serve as a model for future international sporting events. This is the first published report on emergency and urgent eye care at a major sporting event in Canada and for Pan Am and Parapan Games. Dr. Julia Alleyne, CMO, stated, "Our ability to provide timely and appropriate eye care, especially for our athletes and coaches, was made possible by the professional partnership with our

ophthalmologist, optometrist, and opticians. The level of service provided excelled our expectations and I believe this component of care is essential for all multisport Games.”

Disclosure: The authors have no proprietary or commercial interest in any materials discussed in this article.

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REFERENCES

1. Lu V. Toronto wins 2015 Pan Am Games. *Toronto Star*. September 9, 2009. Available at: www.thestar.com/sports/pan_am_games/2009/11/06/toronto_wins_2015_pan_am_games.html. Accessed April 7, 2011.
2. WATERFRONToronto web site. Toronto 2015 Athletes' Village / West Don Lands / Explore Projects / Waterfront Toronto. Available at: www.explorewaterfrontoronto.ca/project/pan-am-athletes-village. Accessed January 30, 2014.
3. CBCNews web site. *Pan Am Games security now expected to cost \$239M*. Toronto, Ontario, Canada: The Canadian Press; March 3, 2014. Available at: www.cbc.ca/news/canada/toronto/pan-am-games-security-now-expected-to-cost-239m-1.2558569. Accessed February 21, 2015.
4. Jorm LR, Thackway SV, Churches TR, Hills MW. Watching the Games: public health surveillance for the Sydney 2000 Olympic Games. *J Epidemiol Community Health*. 2003;57:102-8.
5. D'Ath PJ, Thomson WD, Wilson CM. Seeing you through London 2012: eye care at the Olympics. *Br J Sports Med*. 2013;47:463-6.
6. Liang XY, Lan L, Chen WN, et al. Disease distribution and medical resources during the Beijing 2008 Olympic and Paralympic Games. *Chin Med J (Eng)*. 2011;124:1031-6.
7. Wilson CM, Thomson WD, D'Ath PJ. Seeing you through London 2012: eye care at the Paralympics. *Br J Sports Med*. 2013;47:869-72.

Can J Ophthalmol 2019;54:1-6

0008-4182/17/\$-see front matter © 2019 Published by Elsevier Inc on behalf of the Canadian Ophthalmological Society.
<https://doi.org/10.1016/j.jcjo.2018.02.020>