Clinical Lessons for Team Physicians: what the IISS tells us!

Professor Wayne Derman MD PhD
IPC Medical Commission
University of Cape Town
Greetings and Thanks from Cape Town
Illness and injury in athletes during the competition period at the London 2012 Paralympic Games: development and implementation of a web-based surveillance system (WEB-IISS) for team medical staff

Wayne Derman, Martin Schwellnus, Esme Jordaan, Cheri A Blauwet, Carolyn Emery, Pia Pit-Grosheide, Norma-Angelica Patino Marques, Oriol Martinez-Ferrer, Jaap Stomphorst, Peter Van de Vliet, Nick Webborn, Stuart E Willick

Factors associated with illness in athletes participating in the London 2012 Paralympic Games: a prospective cohort study involving 49,910 athlete-days


The epidemiology of injuries at the London 2012 Paralympic Games

Stuart E Willick, Nick Webborn, Carolyn Emery, Cheri A Blauwet, Pia Pit-Grosheide, Jaap Stomphorst, Peter Van de Vliet, Norma Angelica Patino Marques, Oriol Martinez-Ferrer, Esmè Jordaan, Wayne Derman, Martin Schwellnus
What is the relevance to the team physician?

- How many of my athletes will get injured or ill?
- What illnesses and injuries are the most common?
- What are high risk sports?
- What are the mechanisms and aetiology
- Can I reduce or prevent illness and injury in my team?
Illness and injury in athletes during the competition period at the London 2012 Paralympic Games: development and implementation of a web-based surveillance system (WEB-IISS) for team medical staff

Wayne Derman,1,2 Martin Schwellnus,1,2 Esme Jordaan,3 Cheri A Blauwe1t,4,5 Carolyn Emery,6,7 Pia Pit-Grosheide,5 Norma-Angelica Patino Marques,5,8 Oriol Martinez-Ferrer,5,9 Jaap Stomphorst,5,10 Peter Van de Vliet,5,11 Nick Webborn,12 Stuart E Willick5,13

Table 1
Athlete-days in countries with and without own medical support in the precompetition, competition and total study period of the London 2012 Paralympic Games

<table>
<thead>
<tr>
<th></th>
<th>Countries without own medical support (EMDCS)</th>
<th>Countries with own medical support (EMDCS and WEB-IISS)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPCs (n)</td>
<td>82</td>
<td>78</td>
<td>160</td>
</tr>
<tr>
<td>Athletes (n)</td>
<td>236</td>
<td>3329</td>
<td>3565</td>
</tr>
<tr>
<td>Athlete-days (precompetition period)</td>
<td>708</td>
<td>9987</td>
<td>10695</td>
</tr>
<tr>
<td>Athlete-days (competition period)</td>
<td>2596</td>
<td>36619</td>
<td>39215</td>
</tr>
<tr>
<td>Athlete-days (total period)</td>
<td>3304</td>
<td>46606</td>
<td>49910</td>
</tr>
</tbody>
</table>
Illness and injury in athletes during the competition period at the London 2012 Paralympic Games: development and implementation of a web-based surveillance system (WEB-IISS) for team medical staff

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| Table 2 |
|-----------------------|-----------------------|-----------------------|
| Incidence rate of percentage of athletes with injury and illness reported during the precompetition, competition and total period of the London 2012 Paralympic Games |
| Precompetition period (3 days) | Competition period (11 days) | Total period (14 days) |
|                      | 95% CI       | 95% CI      | 95% CI           |
| Injury               |              |              |                   |
| IR                   | 14.8         | 12.6         | 17.3              |
| % of athletes        | 4.3          | 3.6          | 4.9               |
| Illness              |              |              |                   |
| IR                   | 14.6         | 12.4         | 17.1              |
| % of athletes        | 3.9          | 3.3          | 4.6               |

IR, incidence rate (injuries/illness per 1000 athlete-days) with 95% CI.

Olympic Games:

- 11% Injured
- 7% Illness
- ? Exposure data
- ? 9.2 Inj/1000 a days
- ? 5.1 Ill/1000 a days
Results

- 633 injuries identified in 539 athletes
- Incidence proportion (IP) = 17.8 injuries/100 athletes (95% CI; 16.5-19.0)
- Vancouver 2010 Winter Paralympics IP = 23.8 injuries/100 athletes (95% CI; 20.1-27.7) (n=505)
- Injury incidence rate (IR) = 12.7 injuries/1000 athlete-days (95% CI; 11.7-13.7)
Injury Rate by Sport

1. Football 5-a-side
2. Power lifting
3. Goal ball
4. Wheelchair Fencing
5. Wheelchair Rugby
6. Athletics

doi:10.1136/bjsports-2013-092374
Injury Rate by Body Part

1. Shoulder
2. Wrist/Hand
3. Elbow
4. Knee

Proportion of all injury by impairment

All Injury

- Amputee
- Other
- Spinal injury
- VI
<table>
<thead>
<tr>
<th></th>
<th>Total period</th>
<th>Precompetition period</th>
<th>Competition period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>IR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Females</td>
<td>196</td>
<td>11.5</td>
<td>9.9 13.2</td>
</tr>
<tr>
<td>Males</td>
<td>437</td>
<td>13.3</td>
<td>12.1 14.6</td>
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<tr>
<td>Age 13–25</td>
<td>180</td>
<td>11.3</td>
<td>9.7 13.0</td>
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<tr>
<td>Age 26–34</td>
<td>254</td>
<td>14.5</td>
<td>12.8 16.4</td>
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<tr>
<td>Age 35–67</td>
<td>199</td>
<td>12.1</td>
<td>10.5 13.9</td>
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<tr>
<td>All injuries</td>
<td>633</td>
<td>12.7</td>
<td>11.7 13.7</td>
</tr>
</tbody>
</table>

N = Number of athletes  
IR = Incidence Rate (# injuries/1000 athlete-days)

- Injury rates were similar in male and female athletes  
- Median age = 30 years (range 13–67)  
- Highest Injury Rate in 26-34 year old athletes
Injury Onset by Sport

- New onset acute traumatic injuries = 51.5% of all injuries
- Chronic overuse injuries = 31.8% of all injuries
- Acute on chronic injuries = 16.7% of all injuries

<table>
<thead>
<tr>
<th>Sport</th>
<th>Number of injuries</th>
<th>Percentage of acute injuries</th>
<th>Percentage of acute or chronic injuries</th>
<th>Percentage of overuse injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football 5-a-side</td>
<td>22</td>
<td>54</td>
<td>23</td>
<td>23</td>
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<tr>
<td>Powerlifting</td>
<td>44</td>
<td>14</td>
<td>25</td>
<td>61</td>
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<tr>
<td>Goalball</td>
<td>30</td>
<td>77</td>
<td>10</td>
<td>13</td>
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<tr>
<td>Wheelchair fencing</td>
<td>24</td>
<td>42</td>
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<td>58</td>
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<tr>
<td>Wheelchair rugby</td>
<td>18</td>
<td>61</td>
<td>22</td>
<td>17</td>
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<tr>
<td>Athletics</td>
<td>216</td>
<td>50</td>
<td>21</td>
<td>29</td>
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<tr>
<td>Judo</td>
<td>25</td>
<td>64</td>
<td>16</td>
<td>20</td>
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<tr>
<td>Wheelchair tennis</td>
<td>19</td>
<td>37</td>
<td>16</td>
<td>47</td>
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<tr>
<td>Table tennis</td>
<td>40</td>
<td>47</td>
<td>8</td>
<td>45</td>
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<tr>
<td>Wheelchair basketball</td>
<td>34</td>
<td>65</td>
<td>12</td>
<td>23</td>
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<tr>
<td>Football 7-a-side</td>
<td>15</td>
<td>73</td>
<td>20</td>
<td>7</td>
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<tr>
<td>Seated volleyball</td>
<td>23</td>
<td>65</td>
<td>13</td>
<td>22</td>
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<tr>
<td>Cycling track</td>
<td>12</td>
<td>75</td>
<td>0</td>
<td>25</td>
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<tr>
<td>Equestrian</td>
<td>9</td>
<td>56</td>
<td>22</td>
<td>22</td>
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<tr>
<td>Swimming</td>
<td>62</td>
<td>47</td>
<td>16</td>
<td>37</td>
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<tr>
<td>Archery</td>
<td>15</td>
<td>33</td>
<td>20</td>
<td>47</td>
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<tr>
<td>Boccia</td>
<td>11</td>
<td>91</td>
<td>0</td>
<td>9</td>
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<tr>
<td>Cycling road</td>
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<td>71</td>
<td>12</td>
<td>17</td>
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<tr>
<td>Sailing</td>
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<td>Rowing</td>
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<tr>
<td>Shooting</td>
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<td>100</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>
Highlights

- Web-based injury surveillance (IPC-IIS) ↑’s compliance
- Male and female athletes have similar injury rates
- In female athletes, pre-competition injury rates are higher than competition injury rates
- Injury rates are the lowest in the younger athletes
- Half of all injuries seen at the summer Paralympics are new onset acute injuries
- Highest rates of injury are shoulder, wrist/hand and elbow injuries
- Highest rates of injury in football 5-a-side, powerlifting, goalball, wheelchair fencing, wheelchair rugby, & athletics
Protection of the health of the athlete.

- Illness may not be benign (time loss or life threatening)
- Return to play
What illnesses are common in Paralympic Athletes?

Illness Proportion (%)

- Respiratory
- Skin and subcutaneous tissue
- Digestive
- Nervous system
- Genitourinary
- Ears and mastoid
- Eye and adnexa
- Mental or behavioural
- Endocrine, nutritional, metabolic
- Circulatory
- Specific medical conditions related to sport
- Other infections / parasitic disease
- Haematological and immune
- Other

Derman EW, Schwellnus MP et al., BJSM 2013
In which sports are illness more common?

Schwellnus MP, Derman EW et al., BJSM 2013
What are the symptoms of illness in Paralympic athletes?

Data of Derman, Schwellnus, Jordaan In Prep 2014
What is the aetiology of illness in Paralympic athletes? (385 illnesses)

All illnesses

- Pre existing
- Infection
- Exercise related
- Environment
- Other

Data of Derman, Schwellnus, Jordaan In Prep 2014
Which Impairment Classes have the most Illness? (385 illnesses on WEB-IISS)

- Groups with most illness:
  - Spinal cord injury (30%)
  - Amputation/limb deficiency (26,5%)
  - Visually disabled (19%)
  - CP, II and Les autres (remainder)

Data of Derman, Schwellnus, Jordaan In Prep 2014
Illness in impairment classes
(385 illnesses on WEB-IISS)

- Skin and subcutaneous illnesses
  - Spinal cord injured (46.7%)
  - Amputation/limb deficiency (31%)
- Urinary tract infection
  - Spinal cord injured (77.4%)

Data of Derman, Schwellnus, Jordaan In Prep 2014
When do Paralympic athletes report illness to the Dr?

Data of Derman, Schwellnus, Jordaan In Prep 2014
How severe are the illnesses seen in Paralympic athletes?

Data of Derman, Schwellnus, Jordaan In Prep 2014
Take home messages:

- Illnesses are common in paralympic athletes (high incidence)
- Incidence of illness similar in pre-competition vs competition period
- The spectrum of illnesses is different
- Most common are respiratory but non-respiratory illnesses (especially UTI and Skin & GIT are common)
- Participation in athletics is a risk factor
- Age and gender are not independent predictors
- Spinal injured and amputees are at risk of these illnesses
- Most illnesses are infections
- Don’t forget allergy
- Athletes (esp SCI) may not display the usual symptom patterns (vague)
- High index of suspicion
Take home messages:

- Paralympic athletes report late to the Doctor
- Remember prevention principles
- Most illness does not result in time loss (but 20% does)!
- Remember return to play considerations especially wrt respiratory tract infections and systemic symptoms
We look forward to learning more about illness and injury in the winter sports....
Thank you for your attention
AND YOUR ONGOING PARTICIPATION!

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