

### **Article Title**

Testing for boosting at the Paralympic games: policies, results and future directions

### **Article Citation**

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### **Adaptive Sport/Recreation Categories**

- Paralympic games
- Boosting
- Doping
- Medical illness

**Study Type:** Cross-sectional study

### **Summary**

Athletes with high level spinal cord injury (SCI) at three major international Paralympic events competing in relevant classification sport classes in Athletics (wheelchair racing) and Handcycling were tested for “boosting” (intentional induction of autonomic dysreflexia (AD) with the aim to improve sports performance), which is medically dangerous and is banned by the International Paralympic Committee (IPC). Athletes and team staff were educated about the risks of AD at the events. Systolic blood pressure (SBP)  $\geq 180$  mm Hg was considered a positive test and out of 78 tests performed in 56 athletes, no athlete tested positive for AD. The IPC plans to continue to work on improving the testing and program to deter boosting, while recognizing that education about the significant risks of AD provided by team physicians, trainers, and coaches to athletes is also important in deterring the practice of boosting.

### **Article Strengths**

- Testing protocol was simple, rapid (<3 minutes), and seemed convenient during competition (testing location was thoughtfully placed to minimize interruptions to athlete’s competition preparation).
- Providing education to athletes and team staff on AD and the risks of boosting is a great initiative as data has shown a lack of education on this topic. The education provided through this study may have been effective in decreasing boosting rates in athletes.

### **Article Weaknesses**

- Testing protocol is limited as blood pressure (BP) is just one clinical sign of AD, but the other factors (e.g. flushing, diaphoresis, nasal congestion, etc) are subjective and more difficult to measure.
- To prevent potential false positives of boosting, the study authors noted athletes who have a history of elevated BPs on an ongoing basis due to frequent, unintentional exacerbations and per their protocol, would not count these athletes as testing positive for boosting.

- While no study participants reported this history, the following should be considered if this protocol is to be used in future studies: While medical documentation was required to validate this, it is unclear how a medical provider would be able to adequately prove that these are truly unintentional exacerbations. In addition, elevated SBP  $\geq 180$  mm Hg and/or AD, whether intentional or not, should be considered medically unsafe in all cases and sports participation/competition should be reconsidered until BP is better controlled.
- One athlete had a borderline SBP result and even though none of the athletes had a SBP  $\geq 180$  mm Hg when spot checked, it is possible that boosting may still have occurred at other times. The SBP threshold was chosen to avoid false positives of mildly elevated SBP from prerace anxiety, excitement, physiological effects from warm-up, etc. However, AD could still present with hypertension with a SBP  $< 180$  mm Hg.
- Difficult to generalize the study results to all athletes with high spinal cord injury at risk for boosting: Study had relatively small sample size and participants were mostly male (only 6 females). Study also only evaluated athletes from Athletics and Handcycling and not other sports, where boosting may also occur.

### **Take Home Messages**

- This study found no positive tests for boosting, but it is possible that boosting still occurred and the testing protocol had limitations in detecting these cases.
- This study presented the IPC's policy on AD and boosting in the literature for the first time.

### **Impacts on Clinical Practice:**

- The IPC is working on improving the testing protocol to detect signs of boosting and will need to consider other objective outcome measures that have improved sensitivity and specificity compared to BP measures.
- Increased athlete/team staff education about the risks of AD and boosting has been implemented and may be effective in decreasing the rates of athlete boosting.
- Medical personnel providing coverage of Para sports events should recognize the common signs and symptoms of AD (either intentional or unintentional) in athletes with high spinal cord injury (generally in injuries at T6 and above) and be familiar with management/treatment.