



The Acute Physiological and Metabolic Responses of Individuals with Cerebral Palsy to RaceRunning Training



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What is RaceRunning?





Driver #1: The Opportunity Provided by RaceRunning

Driver #2: Furthering Knowledge on “Physiological Safety”

Limited research....

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KINESIOLOGIC AND METABOLIC RESPONSES OF PERSONS WITH CEREBRAL PALSY TO SUSTAINED EXERCISE ON A PETRA RACE RUNNER

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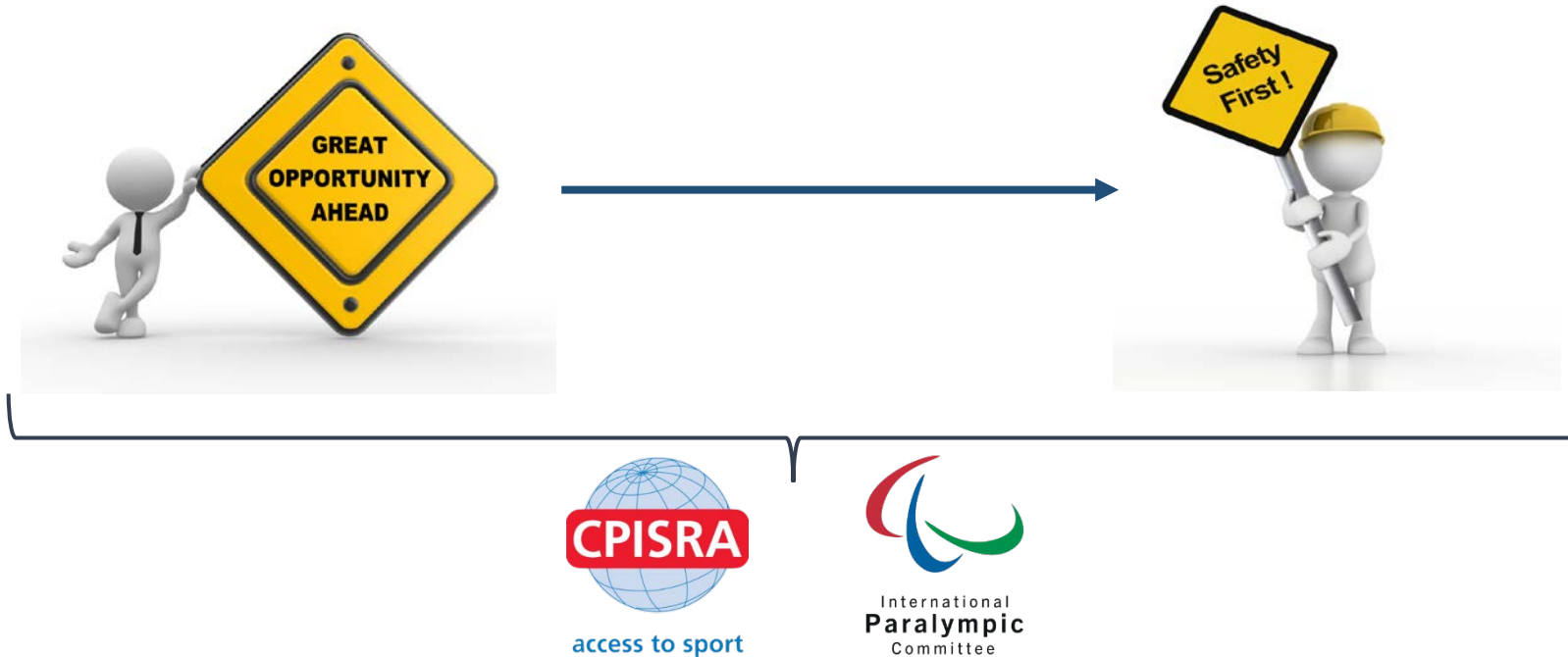
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“...heart rate rose immediately to high levels, and was sustained at this level through the test. Blood lactate concentration increased in a curvilinear pattern, but was subject to much inter-individual difference.”

“Some people with CP will find [RaceRunning] at any speed to be a high intensity activity, and thus it is not suitable for aerobic conditioning.”



Driver #3: Supporting the Development of RaceRunning as a Sport and Recreation



Evidenced-based recognition for use by promotional/governing bodies

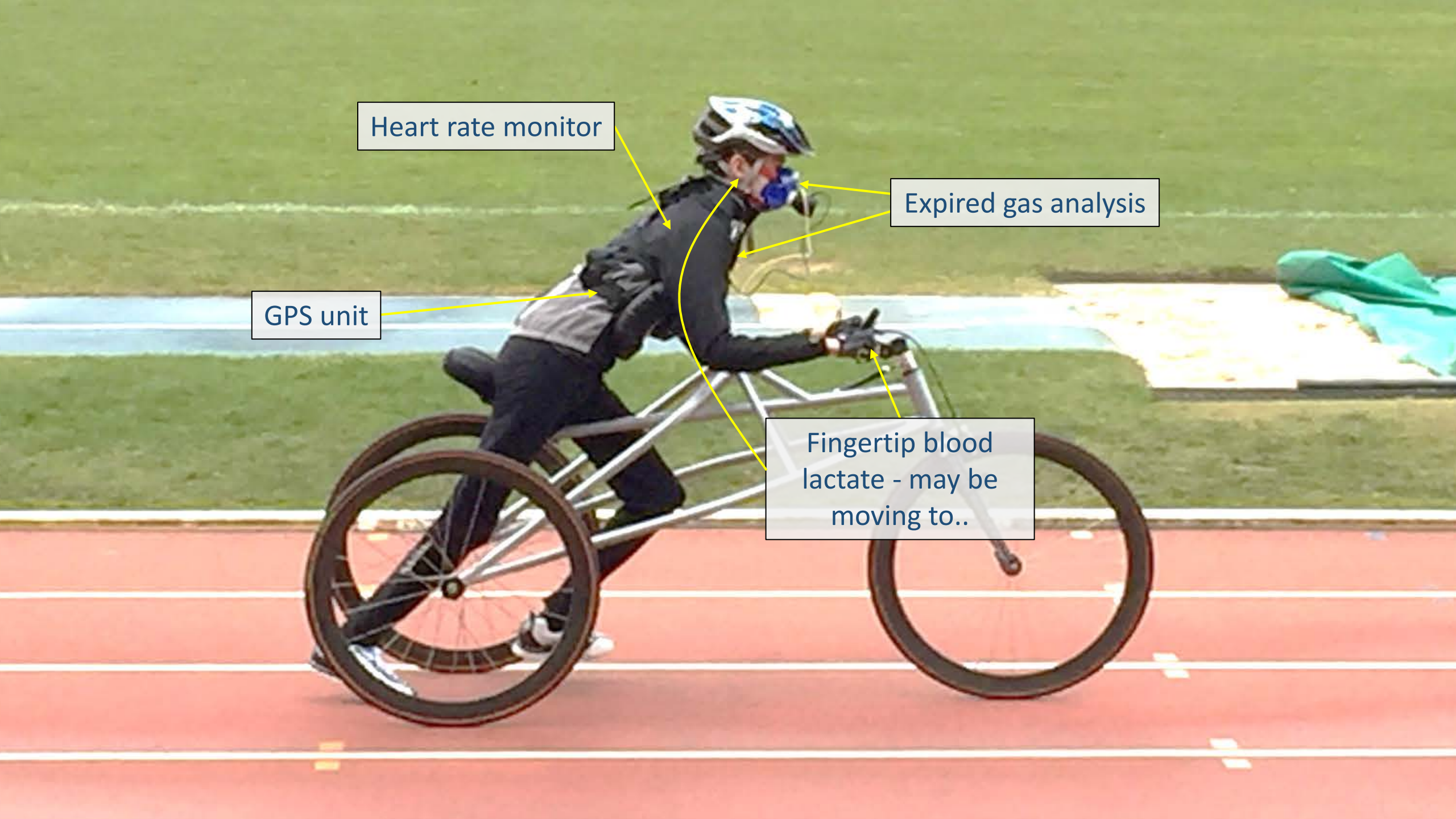
Our Questions

1. What are the movement, cardio-respiratory and metabolic responses to typical RaceRunning training in experienced RaceRunning athletes?
2. What are the movement and heart rate demands observed during RaceRunning competition in experienced RaceRunning athletes?
3. What are the sub-maximal and maximal cardio-respiratory and blood lactate responses to a novel incremental field-based test in experienced RaceRunning athletes?

Methods

- Five participants (age 18 ± 4 years, RR experience 5 ± 1 years, Gross Motor Function Classification Score 3.6 ± 0.9).
- Three habitual training sessions:
 - 1) 2 mile run + 2 x 100 m sprints (1 - 4)
 - 2) 6 x 200m sprints (2 - 5)
 - 3) 5 x 100m sprints (1)
- Heart rate (HR) measured 5 min pre-training, during, and 10 min post-training to determine resting HR and percentage of predicted HR maximum (%HRmax) defined as 194bpm (4).
- GPS derived movement demands.
- Expired gas analysis before and after session 3 to determine resting metabolic parameters before and after to training.





Heart rate monitor

Expired gas analysis

GPS unit

Fingertip blood lactate - may be moving to..

Results

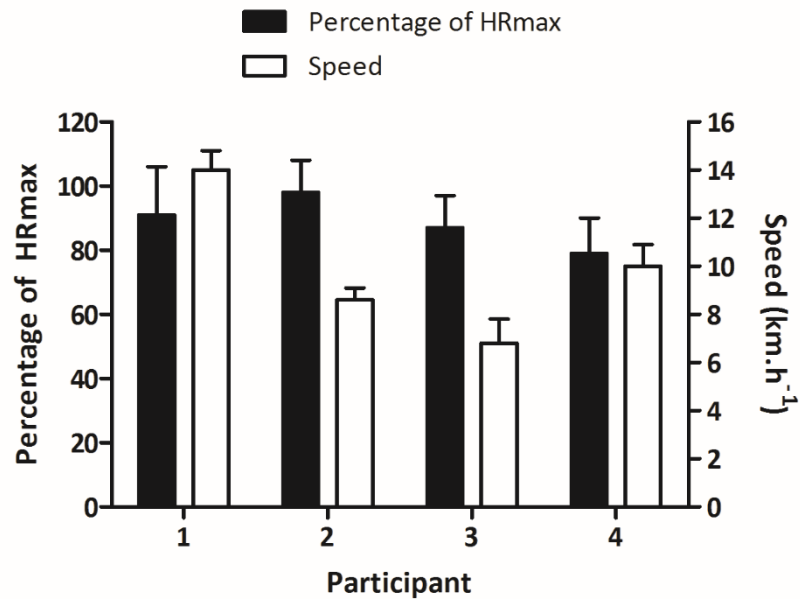


Fig 1: Mean percentage HRmax and speed for a 2 mile run.

Fig 2: Peak and recovery HR for each 200m sprint (S) and recovery period (R)

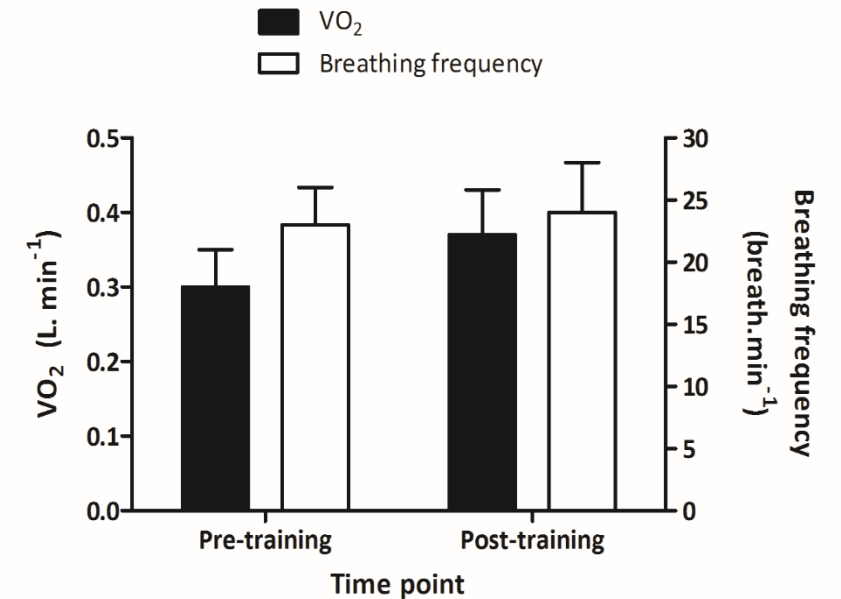
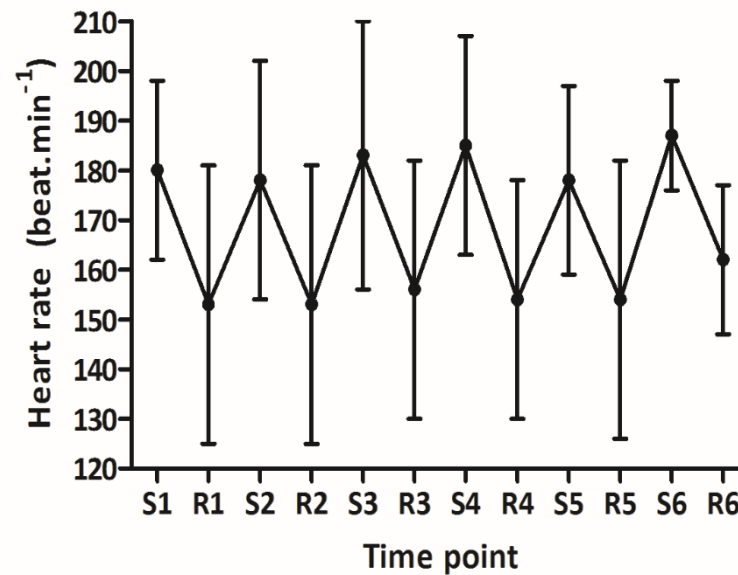


Fig 3: Mean VO₂ and breathing frequency at rest pre- and post-training (n = 1).

Summary

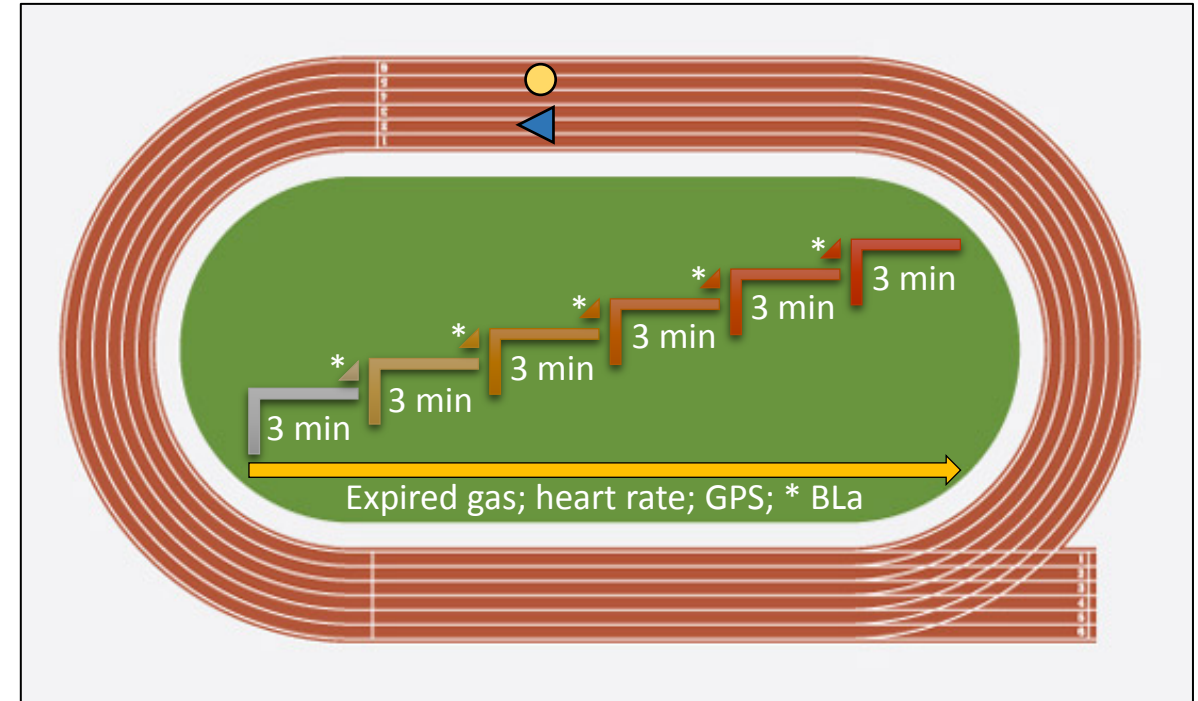
RaceRunning appears to provide an opportunity for individuals with CP to perform activities at a sufficient intensity to promote health and fitness adaptations.

Additional work is required to further quantify the physiological and movement demands of RaceRunning athletes to training and competition, and characterise these demands relative to individual physiological capacity.

Moving Forwards



Physiological and GPS data collected from 36
international RaceRunners
(including World-Record performances!)





International
Paralympic
Committee



access to sport



@DrShaunPhillips