

National Referees Visit the Sport Science Laboratory!

Following the 2013 Australian Championships, a few top-class referees visited the University of the Sunshine Coast's sport science lab to test their fitness. Raymond Dent (Gold Coast), Jason Gillespie (Gold Coast) and Andrew Garland (Sydney) undertook a maximal exercise test to assess their $VO_2\max$, the gold standard measurement of cardio-respiratory fitness. The test involved referees running on an \$80,000 treadmill until physical exhaustion while heart rate and gas expiration were analysed.

Raymond Dent – $VO_2\max$ Test

	Ray	NRL	Rugby Union	Soccer (EPL)
$VO_2\max$ (ml.kg.min ⁻¹)	55.1	59.8	52.3	50.9

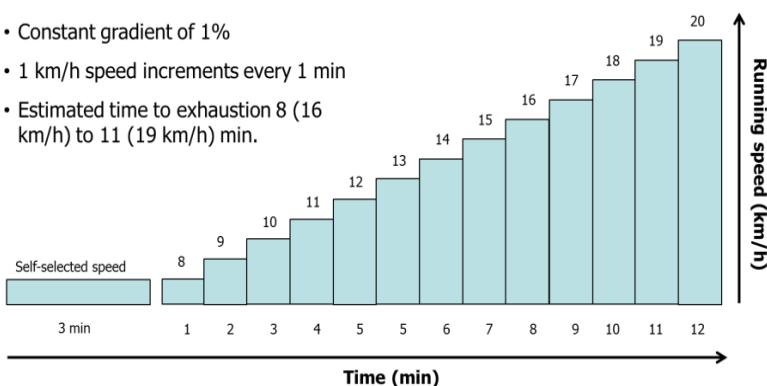
A Bit of Science

Maximal oxygen uptake ($VO_2\max$) is one factor that determines an athlete's capacity to perform sustained exercise. It refers to the maximum amount of oxygen an individual can utilise during intense or maximal exercise. $VO_2\max$ is measured using a metabolic cart (right) that assesses the volume and oxygen concentration of inhaled and exhaled air. Using $VO_2\max$ data combined with heart rate, we can gain an understanding of 'energy system' utilisation during refereeing performances. Therefore, we can design more optimal training programs that develop the aerobic and anaerobic energy systems for Oztag performance.



Queensland Referee, Raymond Dent, undertaking the maximal exercise test at the University of the Sunshine Coast laboratory.

- Constant gradient of 1%
- 1 km/h speed increments every 1 min
- Estimated time to exhaustion 8 (16 km/h) to 11 (19 km/h) min.



Raymond Dent smashed the maximal exercise test, scoring a $VO_2\max$ of 55.1. That score puts him higher than the average scores reported for professional rugby union and soccer referees! If you'd like to test your fitness, try the exercise protocol found here (left). Ray cancelled at stage 10 (18 km/h). Fellow Gold Coast referee, Jason Gillespie, was on par – also cancelling the test during stage 10.

Thank you to the referees who volunteered their time to undertake the Maximal Exercise Test at the University of the Sunshine Coast. Andrew Garland (Sydney), Raymond Dent (Gold Coast) and Jason Gillespie (Gold Coast).

In the next Issue:

Preparing for the 2013 Queensland State Cup!

Do you have a question for the sport science team?

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**Do you have a Question?
Ask the Sport Science Team!**