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### **Kick-off!**

## **A new study may change the way that Rugby League players train**

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Love it or loathe it, the popularity of Rugby League is indisputable. In Australia 86 000 adults and 71 000 children play the game, not to mention the number of people who make a sport out of watching it and shows about it. Since Rugby League's inception in the 1890s in northern England, it has become fiercely competitive and increasingly demanding on the players.

Despite the game's high profile, few scientific studies have been conducted on the movement patterns and work-load of professional players – and no recent studies have been conducted to reflect changes in game rules – until now.

Long time Rugby League fan Anita Sirotic is completing a PhD at the University of Technology Sydney (UTS), on a series of studies aimed at designing position-specific training programs and more effective testing procedures. Using the Parramatta Eels team as a case study, she has been comparing the movement patterns and physical demands required of specific positions in first and second grade Rugby League.

Forwards, backs, ball players, hookers and full-back positions each have different physical demands placed on them. But according to Sirotic, training regimes do not always reflect this. "Props often play a 20-minute half, have a break and then play another 20-minute half, but their stint often involves more sprinting and fast running. Full-backs on the other hand often play an 80-minute game but do not take part in as many high intensity activities."

Sirotic and two research assistants attended all of Parramatta's home games for the 2004 and 2005 football seasons and filmed specific positions. The games were then viewed on a large screen complete with field dimensions. As she watched, Sirotic marked where the players were on the field. She then placed the player's movements into categories of standing, walking, jogging, running or sprinting and analysed the amount of distance covered using a program called Sportstrak. This enabled her to quantify the work demands and running patterns required of specific positions during competition. Sirotic was also able to identify when players were beginning to fatigue. Her supervisor Dr Aaron Coutts says, "This information will be useful for coaches when determining how

to use the interchange of specific players.”



The data are currently being analysed to produce a position-specific running protocol using a custom-built non-motorised treadmill (developed in 2003 by Coutts, with US company Woodway and the Adelaide-based Fitness Technology company) that measures force and performance in athletes.

In the early stages of her research Sirotic tested the non-motorized treadmill to make sure that it was a reliable method to measure the performance of team sport athletes. Eleven male athletes from Rugby League, soccer, AFL and hockey visited the Kuring-gai campus on three occasions and completed an identical 30-minute protocol. The results showed that she could reliably replicate the running demands of team sports in a laboratory setting. The combination of results from this early work, are now being used to develop and monitor specific training programs for professional Rugby League players.

‘ The concept has applications for training in other team sports as well ’

Using ongoing analysis from Sportstrak, Sirotic was able to identify an improvement in the Parramatta Eels’ performance during 2005. “I found that the average speed of player movement in some key positions had increased during this time. We think that the most likely reasons were that the Parramatta Eels changed some players in important positions as well as training methods and tactics this year” said Sirotic.

The concept has applications for training in other team sports as well. “It’s a big step in terms of sports research and training. We’ve narrowed it down to Rugby League for the moment but it would be of benefit to any team sport,” she said.

Once the protocol has been written, Sirotic will complete a training study on Rugby League players. “Our next step is to determine training methods that are specific to the game demands and then to develop strategies that can optimise training to improve running ability and hopefully match performance in Rugby League.”



PhD student and long time Rugby League fan, Anita Sirotic

Sirotic, who has always had a keen interest in sport, completed an undergraduate degree in Sports and Exercise Management at UTS followed by an honours year in human movement, also under the supervision of Aaron Coutts.

The honours research which involved an intensive three-week training study with 18 female touch football players, focused on using the custom-built non-motorised treadmill to demonstrate that increased oxygen uptake increases athletes ability to perform prolonged intermittent high-intensity exercise such as repetitive sprints on the sports field. Sirotic and Coutts assessed the participants' fitness components, particularly endurance capacity, oxygen uptake, anaerobic capacity (exercising with insufficient oxygen in the muscles), the anaerobic threshold and other sports science measurements. The results showed that both interval training and small-sided games training were appropriate methods to increase maximal aerobic capacity in field sport athletes. Sirotic also showed that increasing oxygen uptake allows field sport athletes to perform more work during high-intensity activities such as repetitive sprints, which are important for success in field sports.

Ironically at the end of year 12, Sirotic tossed up between studying architecture and sports and exercise management, but decided against architecture because of the many years of study involved. Her honours year whetted her appetite to hone in on a more specific area of research and to concentrate on Rugby League. When her PhD is complete Sirotic hopes to continue working in this field. ❖