

Interdisciplinary team supporting squash players to break the Guinness World Record

Dr Nicola Gerrett, Gavin Thomas, Annie Lambeth-Mansell CSci and Dr Clare Rhoden outline the interdisciplinary support they provided to two amateur squash players attempting to break the Guinness World Record.

Quick movements, powerful strokes, deep lunges, outstretched limbs and breathless players moving diligently around the court to beat their opponent are the typical characteristics of a 30-40 minute competitive squash match. How this would look after 36 hours was difficult to imagine for us, the interdisciplinary support team working with two amateur squash players attempting to break the Guinness World Record. Len Granger and Jamie Barnett approached staff at the Motion Performance Centre (University of Worcester) to support their attempt at breaking the current 35 hours, 2 minutes and 3 seconds Guinness World Record for the longest squash match. Our team comprised two physiologists (Gavin Thomas and Dr Nicola Gerrett), a nutritionist (Annie Lambeth-Mansell) and a psychologist (Dr Clare Rhoden) and two research students (Matt Davies and Charles Steward). Together we were able to discuss and plan the interdisciplinary nature of the support. The approach guarded against any competing requirements between the team and avoided overloading the players, who also had full-time jobs and family commitments.

Physiological support

The scientific literature underpinning squash is sparse but ultra endurance squash even more so, however a relatively high $\dot{V}O_{2max}$ is important for both squash and ultra endurance events (>53 ml/kg/min). The players' $\dot{V}O_{2max}$ values were far off the mark (<43 ml/kg/min), which were likely impaired by their relatively high body fat levels ($>17\%$). Estimations based on ultra-endurance events suggested that after 10 hours the maintainable exercise intensity would drop to 40-45% $\dot{V}O_{2max}$. For the players this would equate to walking, which was problematic given the rules imposed by the Guinness World Record for maintaining a competitive element throughout the challenge. With only 5 months to prepare we had to implement time-efficient strategies but also be realistic with what the players could achieve without overtraining or injury. Therefore a key focus of the training programme was to enhance aerobic fitness and make favourable changes to body composition via education and enhancing fat oxidation.

The education focused on explaining the importance of the bespoke training programmes, utilising heart rate monitors as training tools, answering questions and designing a back-up plan to manipulate training if work or family commitments interfered. It was important that Len and Jamie completed weekly training diaries and uploaded well-being scores using online software, so we could keep track of them from afar and they could monitor themselves, which was extremely effective.

We worked alongside the sports nutritionist to devise a training and nutritional intervention to enhance fat oxidation. The training programme adhered to the principles of progressive overload through changes in frequency, intensity, volume and type of exercise. Utilising their data to prescribed training intensities relative to their lactate threshold values served to (1) increase the rate of energy produced aerobically and (2) increase the economy of movement to help to delay the onset of fatigue. To reduce the likelihood of injuries the weekly training volume did not increase by more than 10%. The majority of training was long slow runs but due to other commitments the players were unable to train longer than 90 mins. Therefore, high-intensity bicycling interval training, using a work ratio of 1:8, was incorporated into the programme. This was to serve as a time-efficient alternative stimulus, which has



Above: Len and Jamie celebrating at the end of their successful Guinness World record for the longest squash match. Courtesy James Crockford.



Above: Len and Jamie during an allocated 5 minute rest period. Courtesy Steve Feeney.

been shown to induce similar skeletal muscle and cardiovascular adaptations to that of traditional endurance training (Kavaliuskas *et al.*, 2015). The players were tested regularly during the 5-month period to monitor progress and inform training.

Nutritional support

The nutritional support was provided via a series of face-to-face meetings and documented advice throughout the preparation phase for the event. It was clear from the outset that the level of nutritional knowledge of both players was rudimentary and the focus was basic nutritional education. The key issues established for both players during the training phase were to reduce body mass, reduce fat mass, support lean mass maintenance and development, and support the fuelling needs of training.

Both players were required to reduce their energy intake, increase their protein consumption, reduce refined carbohydrates, and increase healthy fat sources. They were provided with a range of food options and portion advice for each mealtime, in addition to the nutritional education provided in the meetings. Robinson *et al.* (2014) demonstrated that a combination of simple educational messages and food-choice resources to be an effective strategy for prompting effective dietary change, as opposed to rigid meal plans.

Each player was provided with a series of actions following each meeting, for example:

- Cut out energy drinks and drink more water. Both players were keeping themselves going throughout the day with high sugar and caffeine drinks instead of nutritious foods and suitable hydration
- Reduce alcohol intake
- Replace high carbohydrate breakfast with a protein rich breakfast and increase protein intake across the day. Recommendations were provided for a range of protein options for each meal in order to distribute protein evenly across the day to support muscle mass development, satiety and prevent lean body mass loss in an energy deficit
- Reduce the high intake of refined sugars (cereal, cereal bars, biscuits, sweets, sugary drinks). These were to be replaced from a list of macronutrient balanced snack options
- Eat more vegetables and a little fruit, as the current intake was minimal to none. This will provide bulk to the reduced energy diet, and increase the micronutrient content of the diet.

Due to the gradual implementation of the diet changes and the range of food choices available for each meal, the players were able to adhere to the actions provided in each meeting. The advice given alongside their training programme saw both players reduce body weight and percentage body fat continually throughout the 5-month period.

Just prior to the challenge they were keen to report a summary of their current diet: “Simply: Energy Drinks - gone; Fast Food - gone (the odd subway salad); Chocolate - minimal; Alcohol - maximum one beer a week; Fizzy Drinks - sugar free only; Snacks - not very often, fruit or maybe some nuts.”

Psychological support

With two extremely motivated players, fatigue, sleep deprivation and mental toughness were psychological related issues I considered relevant initially. But after only a 4-hour trial the players highlighted concerns about the level of boredom they would experience during the event. Subsequent to this I also considered the concept of the effective dyad (pair) (Wickwire *et al.*, 2004) where intense relationships are often experienced. The ability to listen, take advice and criticism whilst also having to deal with someone else's emotions as well as your own become crucial factors in the functioning of the dyad. Although competing against each other in this match, they were undertaking this challenge together as a pair.

For me, the project had two phases. Initially the players had to significantly increase their fitness and this was the primary focus at the start. Psychological support at this stage focused on helping the players remain motivated amidst the physically demanding training schedule. Later the support focused on the psychological characteristics and skills each player possessed and how this would potentially help or hinder them. Interventions focused on developing strategies to combat the boredom, to relax during rest periods and prompting discussions and reflection on their relationship and the roles they might prefer to take during the challenge.

Both players had high levels of mental toughness, confidence and team focus. What was also evident from their psychological profile was a need to utilise goal-setting more effectively and using online software to monitor weekly training sessions along with progress from regular fitness testing helped maintain their motivation.

Relaxation and motivational music playlists were suggested for rest periods. Following a trial match of ~18 hours it became evident that strategies for relaxing during the rest periods were unrealistic. Re-fuelling, receiving sports therapy, toilet breaks and changing into fresh kit left little time for anything else. Additionally, at this point there was a need for the players to understand their different approaches to the challenge after concerns were evident. As such, the focus of support shifted more towards the dyadic relationship. Discussions with one player highlighted the necessity

to understand the components of the dyad and how differences might also mean a greater strength of the pair together. The players then openly discussed their strengths, weaknesses, their belief in each other (Jackson *et al.*, 2008) and where they felt both of them would need or could give support. I feel the players benefited from two psychological components of the project. Firstly, their psychological profile from which they took comfort as it confirmed high levels of mental toughness and confidence. Secondly, it increased their awareness of how they worked together and how they could support each other. This emphasis on the dyadic relationship was to become one of the most important psychological factors in the successful completion of the event.

Conclusion

The key to success in providing interdisciplinary support was time management and communication. Due to the short time schedule and individual time constraints, it was imperative to be time efficient; scheduling meetings, discussions and tests around the same time. We set a rough 6-month plan to guide our progress but ensured that this was flexible to cope with changes or minor setbacks. Utilising online software as a monitoring tool was useful for both the players and the support team. This enabled continual monitoring throughout and prompted frequent discussions about progress and alterations to the intervention objectives.

Jamie and Len successfully broke the Guinness World Record for the longest single game of competitive squash. The record now stands at 38 hours and 27 seconds. ■



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Gavin is a Lecturer at the University of Worcester and is in the final six months of the BASES Supervised Experience programme (physiological support).



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