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EDITORIAL

The Physical Preparation of Players for the Rugby World Cup

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The quadrennial showcase of rugby is the Rugby World Cup (RWC), with the 10th Cup being held in France in September and October 2023. The RWC is the third most popular global sporting event after the soccer World Cup and the summer Olympic games. The 2022 Women's RWC final drew a record crowd of 45,000 in New Zealand. World Rugby has the vision of a global sport for all; it can be played by individuals of all sizes, genders, and abilities. The heart of the game centers on possession of the ball, the expression of free running, and the physicality of tackling and contact.

Other native codes of football include the National Football League (NFL) in the United States, the Australian Football League (AFL) in Australia, and Gaelic football (GAA) in Ireland. These codes enjoy tremendous local support, but, apart from some international forays and exhibition games, they are not widely played across the continents like rugby. The last 2 decades have seen substantial increases in the professionalism, broadcasting, and public appeal of rugby. Rugby can be played in either 15- or 7-player formats; from juniors, seniors, to masters; and from amateur, semiprofessional, to fully professional players who enjoy a high public profile and substantial remuneration.

In the last 10 years, rugby has grown on and off the pitch, with an increasing number of players all over the world. These developments have been accompanied by increasing interest in the science of rugby as related to the physical preparation of players. The annual number of rugby publications in the sport-science and sports-medicine literature has increased substantially in recent years. In the period 2004–2023 there were almost 4000 studies in PubMed with "rugby" as a keyword, of which 1700 (~44%) were injury-focused, but only 11% with "fitness." In the same period "rugby sevens" returned 330 studies comprising 115 in injury (~35%) and 40 in fitness (~12%). The majority of the rugby sevens studies have been published since 2009, when this format of the game was included in the summer Olympic Games (from Rio 2016). Clearly, we need more high-quality rugby research in the areas of physical fitness, training, and conditioning.

The focus of the *International Journal of Sports Physiology and Performance* (*IJSPP*) is on physiology and performance in sports. In this context, this Rugby World Cup Special Issue features a wide range of rugby research articles across the formats of rugby, rugby sevens, and men's and women's rugby. The physiology and performance issues addressed include game analyses, training demands, training interventions, health aspects, technical aspects of tackling, sprinting and running, strength and power training and assessment, and muscular fatigue. Other articles address lifestyle (sleep), ergogenic aids, and environmental exposure (heat and hypoxia), all issues that coaches and rugby support staff contend with. Most of these issues require extensive planning, evaluation, and resourcing before implementation into the training and/or game environment. The challenge for coaches and team support staff is to take these research outcomes and apply them to suit their individual requirements. The advent of GPS technology and related digital platforms has stimulated widespread implementation in the rugby community and a concomitant increase in research studies and publications.[1] This work often brings rugby programs together with university researchers to address issues of practical importance to coaches, players, and support staff.

While observational research is likely to predominate in the elite or professional games, there are many research opportunities in the match, training, testing, and laboratory settings. Multidisciplinary approaches will be profitable where physiology and performance experts can collaborate with a variety of disciplines including strength and conditioning, nutrition, performance analysis, psychology, allied health, and sports medicine. Hot topics such as data analytics, machine learning, concussion, cognitive processing, decision making, and athlete health and their relationship with physiology and performance should be impactful areas of rugby research.

Future developments in rugby research will likely cover the range of game formats across genders, age groups, and levels of ability. The lack of research in women's rugby is starting to be addressed in both 7- and 15-player formats, but many areas require much more scrutiny.[2] These opportunities include core issues of game and physical training demands; customized training interventions suitable for female players; female health issues, especially menstrual-cycle fluctuations and symptomatology; and the influence of hormonal contraception. Similar to many other sports, female-specific guidelines will need developing through evidence-based research rather than simple translation of studies involving male players.

We trust you will enjoy the rugby offerings in this issue of *IJSPP* and, of course, the 10th Rugby World Cup.

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