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# REDs alert: male athletes be wary and scientists take action!

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## THE CURRENT STATE OF AFFAIRS: SEX DISCREPANCY IN REDS

Sports medicine and sport science research has been dominated by studies examining male athletes—with one notable exception: the field of Relative Energy Deficiency in Sports (REDs). This anomaly has occurred due to the accumulation of scientific

publications studying the female athlete triad (expanded to REDs beginning in 2014), along with increased interest in the role of the menstrual cycle on training and performance.<sup>1</sup> This paradox of more female than male research on REDs is slowly changing but still persists. For example, since the 2018 International Olympic Committee's (IOC) consensus statement update on REDs, 178 studies pertaining to low energy availability (LEA) or REDs have been published, and of the nearly 24 000 participants involved in these studies, only ~20% were male.<sup>2</sup> Since the sports medicine and science community has lagged on this issue, clinician knowledge and attention to male athletes suffering from problematic LEA (see [box 1](#)) and REDs, remain significant gaps in athlete health and well-being.

## THE SEX DIVIDE: MALES ARE NOT FEMALES

As noted in the current IOC's updated 2023 consensus statement on REDs, male

### Box 1 Problematic low energy availability (LEA) working definition<sup>2</sup>

Problematic LEA is exposure to LEA that is associated with greater and potentially persistent disruption of various body systems, often presenting with signs and/or symptoms, and represents a maladaptive response. The characteristics of problematic LEA exposure (eg, duration, magnitude, frequency) may vary according to the body system and individual. They may be further affected by interaction with moderating factors that can amplify the disruption to health, well-being and performance.

athletes also experience hormonal, body composition, sexual and psychological changes when they are underfuelled.<sup>2</sup> And, like females, male athletes with problematic LEA have compromised health and performance sequelae.<sup>3–5</sup>

However, as more REDs research publications examining both female and male athletes have appeared, the scientific community has observed that the physiological impact of problematic LEA is not entirely identical between the sexes. Research studies and personal accounts from male athletes in individual, as well as team sports, clearly document this point.<sup>6–8</sup>

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Perhaps the most glaring omission in the male athlete-based research is the lack of systematic investigation of the effects of stepwise reductions in energy availability on various health and performance outcomes. Although the concept of a single EA threshold below which problems occur in all individuals is not favoured, there is evidence (although scant) that males can tolerate exposure to lower levels of EA before developing problematic LEA and/or manifesting the signs and symptoms of REDs as seen in female athletes (we are mindful future evidence may emerge of LEA outcome disparities between the sexes).<sup>6–8</sup> Well-defined prospective experimental studies that investigate gradual and more extreme LEA states in male athletes are needed to understand the characteristics of problematic LEA more clearly in this population. To this end, attempts to develop a specific screening tool to identify male athletes at elevated risk of problematic LEA have shown some difficulties in finding specific and sensitive biomarkers, although a reduction in sex drive characteristics (eg, low libido and decreased morning erections) appears to be a common sign.<sup>9</sup>

### 'MIND THE GAP'

Despite the gradual increase in the scientific understanding since 2014 on REDs in male athletes, there appears to be a significant gap in knowledge translation to those directly involved in male athletic performance, that is, the athletes, coaches and the healthcare entourage. This is illustrated by the experience of American 2:10 marathoner Jake Riley. His REDs diagnosis took months to identify, as both Jake and members of his healthcare team were not fully aware of the aetiology and symptoms of the syndrome relative to men. Riley himself had assumed ... 'you had to be essentially anorexic or bulimic, or really restricting yourself' to develop REDs, and 'because I was only doing the restricted calorie eating in very short slots, and I did not do it for most of the time, it wasn't something we were looking at'.<sup>10</sup> This personal account demonstrates that vigilance by all involved in athlete care for problematic LEA/REDs is essential, and the aetiology of REDs can be individualistic and not universal within athletes.

### CLOSING THE GAP: SHINING THE LIGHT ON MALE ATHLETES

It is time to address this knowledge gap in sports medicine and sport science on male athletes with REDs and expand the scope of REDs research to include more male athlete subjects. In seeking out male athlete study participants, however, researchers should pursue not just elite, high-level athletes, as the health and performance concerns of REDs can have impactful negative consequences on the recreational athlete as well.<sup>7</sup>

Likewise, there needs to be a more effective strategy for knowledge translation of the REDs research in male athletes from the scientific community to at-risk athletes and members of their entourage overseeing health and performance. It is clear that currently the messaging around REDs in male athletes is not being conveyed effectively or broadly enough in the sporting world.

Our recommendation to shine more light on male athletes does not suggest abandonment of continued research on problematic LEA and REDs in athletic females. On the contrary, there remain many unanswered questions concerning both sexes (eg, differences in the aetiology of LEA, societal perspective and coaching norms regarding the focus on physique traits within athletes). Thus, there is an urgent need for more high-quality REDs research approaches (eg, prospective experimental and longitudinal cohort studies using gold-standard methodologies) in both female and male athletes. It is time to take action if we are to enable all athletes to optimise their athletic performance goals while staying healthy.

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