SPEED PROJECT

Sport & Prevention of Emerging Eating Disorders

Special clinical aspects of eating disorders in sports

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• **The ”camouflage" of the disorder:** in sport, many pathological behaviors are mistaken for athletic dedication; dietary restriction is seen as a "performance diet" and excessive exercise as "spirit of sacrifice," making diagnosis far more complex and delayed than in the general population.

•**The dual role of the body:** for the athlete, the body is not merely an aesthetic object to control, but a working tool; this creates a unique pressure where weight is not only tied to self-esteem, but is perceived as a fundamental technical parameter for athletic success.

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The consequences of specific diets adopted to control body weight can be severe.

O'Connor & Caterson: a sudden and drastic drop in body weight negatively affects performance, cognitive functions, and general physical health.

Nattiv et al.: weight loss, even in the absence of a true eating disorder, has medical complications involving the cardiovascular, endocrine, reproductive, gastrointestinal, renal, and central nervous systems.

"The 4 Basic Food Groups are: 'don't eat this', 'don't eat that', 'don't eat those' and 'don't eat that other stuff'."

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Specific physical signs in athletes with eating disorders

Beyond classic signs such as Russell’s sign or dental erosions, clinical attention in athletes must shift toward "functional" signals: sudden drops in performance, recurrent bone injuries (stress fractures), and electrolyte imbalances that can cause dangerous arrhythmias during exertion.

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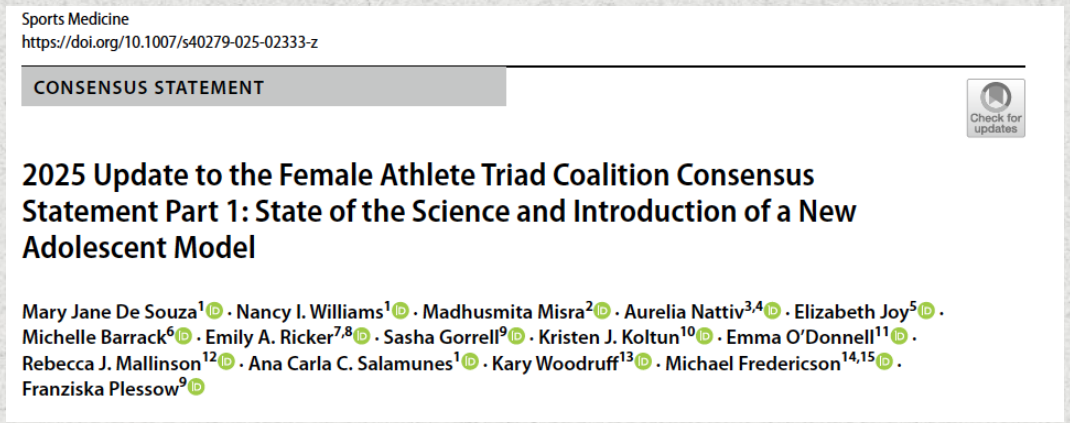
Female athlete triad

The 2025 update of the Female Athlete Triad Coalition Consensus Statement represents a fundamental step forward in the understanding and clinical management of the **Female Athlete Triad**, a condition that particularly affects female athletes but also has important implications for women's health more broadly.

The document integrates the most recent scientific evidence with practical guidelines for prevention, diagnosis, treatment, and return to sport, reinforcing the centrality of the Triad as a clinical model based on solid causal relationships.



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CONSENSUS STATEMENT

Check for updates

2025 Update to the Female Athlete Triad Coalition Consensus Statement Part 1: State of the Science and Introduction of a New Adolescent Model

Mary Jane De Souza[1] · Nancy I. Williams[1] · Madhusmita Misra[2] · Aurelia Nattiv[3,4] · Elizabeth Joy[5] · Michelle Barrack[6] · Emily A. Ricker[7,8] · Sasha Gorrell[9] · Kristen J. Koltun[10] · Emma O'Donnell[11] · Rebecca J. Mallinson[12] · Ana Carla C. Salamunes[1] · Kary Woodruff[13] · Michael Fredericson[14,15] · Franziska Plessow[9]

Sports Medicine
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CONSENSUS STATEMENT

Check for updates

2025 Update to the Female Athlete Triad Coalition Consensus Statement Part 2: Clinical Guidelines for Screening, Diagnosis, Treatment, and Return to Play for Adolescents and Adults

Nancy I. Williams[1] · Mary Jane De Souza[1] · Madhusmita Misra[2] · Aurelia Nattiv[3] · Elizabeth Joy[4] · Michelle Barrack[5] · Emily A. Ricker[6,7] · Sasha Gorrell[8] · Kristen J. Koltun[9] · Emma O'Donnell[10] · Rebecca J. Mallinson[11] · Ana Carla C. Salamunes[1] · Kary Woodruff[12] · Michael Fredericson[13,14] · Franziska Plessow[8]

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Definition

The Female Athlete Triad is defined as the dynamic interaction among three closely related components:

- **Energy deficiency.**
- **Reproductive function alterations.**
- **Bone health impairment.**

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The 2025 consensus reaffirms that **energy deficiency** is the primary etiological factor, capable of triggering a cascade of physiological adaptations involving metabolism, the endocrine system, and the skeletal system. This deficit may result from intentional dietary restriction, eating disorders, excessive exercise, inadequate nutrition, or a combination of factors, even in the absence of a formal eating disorder diagnosis.

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One of the main innovations introduced in 2025 is moving beyond the rigid use of the term “low energy availability” as the sole descriptive criterion.

The consensus proposes the broader term of **energy deficiency**, recognizing that energy availability is difficult to measure precisely in clinical practice and that there is no universal threshold below which Triad alterations appear.

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Metabolic compensation describes the energy-saving physiological adaptations enacted by the body in response to insufficient energy intake. These adaptations include:

- reduction of basal metabolic rate;
- decrease of hormones such as triiodothyronine (T3), leptin, and IGF-1;
- increase in ghrelin.

A clinically relevant aspect is that these adaptations can occur even when **body weight is stable**, making weight-based monitoring alone misleading. For this reason, the consensus emphasizes the importance of serial assessments over time and integrated clinical interpretation.

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Reproductive function

- The 2025 model expands the reproductive function continuum to include not only the presence or absence of menstruation, but also the **quality of ovarian function**, ovulation, and sex hormone exposure. Evidence shows that the return of menstruation after a period of amenorrhea does not necessarily coincide with complete endocrine recovery.
- Many athletes, despite resuming menstrual cycles, present with anovulatory cycles or a persistent reduction in estrogen levels, with possible consequences for bone health. The term **functional hypothalamic oligo-amenorrhea**, emphasizing the need for accurate differential diagnosis, especially in the presence of hyperandrogenism.

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Bone Health

Beyond reduced bone mineral density, the 2025 consensus formally includes **bone stress injuries** within the Triad spectrum. These injuries often represent an early clinical manifestation of energy deficiency and of hypoestrogenism and are associated with a high risk of recurrence and interruption of athletic activity.

The document highlights that **bone health recovery** is slow and uncertain. Intervention studies show that, even after prolonged periods of refeeding and weight recovery, improvement in bone mineral density is not guaranteed, especially if the damage occurs during critical phases of peak bone mass acquisition.

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Adolescent athletes

- One of the most significant contributions of the 2025 consensus is the introduction of a **specific model for adolescent athletes**. At this stage of development, energy deficiency can interfere with growth, pubertal maturation, the achievement of menarche, and bone mass acquisition.
- Pubertal delays, primary or secondary amenorrhea, and reduced bone acquisition can have long-term consequences for skeletal and reproductive health. For this reason, the consensus emphasizes the importance of **early prevention**, systematic screening, and timely interventions appropriate to age and developmental stage.

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Screening and diagnosis

- The consensus recommends that all athletes be evaluated for Triad risk factors, ideally during the Preparticipation Physical Evaluation (PPE). Screening should include **assessment of eating behaviors**, **menstrual function**, and **history of fractures** or bone injuries.
- Validated questionnaires can be useful tools for **identifying risk**, but they do not replace a **comprehensive clinical evaluation**. The document emphasizes the importance of a cautious and contextualized approach, especially in young individuals.

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Return to sport

Decisions regarding **return to sport** must be based on a cumulative risk assessment, considering the severity of the energy deficit, the presence of eating disorders, menstrual status, bone health, and adherence to treatment. The consensus reaffirms that the priority is not athletic performance, but the **athlete's overall health**.

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Athletic anorexia

- Athletic anorexia, in studies by Sundgot-Borgen and Torstveit, is included among eating disorders, as it represents an **abnormal eating pattern** that can lead to serious clinical eating disorders while maintaining its own distinct characteristics (J. Sundgot-Borgen & Torstveit, 2010; Jorunn Sundgot-Borgen & Torstveit, 2004).
- It involves a **reduction in body mass** (including both fat mass and lean mass), due to both caloric restriction and high volumes of exercise, with the aim of improving performance.
- The implementation of restrictive diets or excessive training is often recommended by coaches in order to achieve a macronutrient balance appropriate to the duration and intensity of the physical exercise required by each sport discipline.

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Orthorexia

It involves a genuine phobia of foods considered “dangerous”; the preoccupation with consuming wrong and/or harmful foods comes to dominate other areas of life (emotional, relational, and professional), to the point of a true rigidity of thought focused exclusively on the dietary sphere.

Orthorexia, in particular among athletes, can lead to **excessive food selectivity**, overlooking the fact that a healthy diet, also functional for performance, is characterized by **variety in the foods** consumed (Dunn & Bratman, 2016).

Orthorexia and athletic anorexia are eating conditions with higher prevalence in females.

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Vigoressia (Muscle dysmorphia)

It's characterized by an obsessive **fear of having a lean and underdeveloped body**; despite often having **hypertrophic musculature**, individuals are dissatisfied due to **distorted body image**. Self-esteem is based almost exclusively on body weight and physical appearance, which, measured against unattainable ideals, demands an extreme level of perfectionism.

- overinvestment in one's own body;
- pursuit of physical perfection;
- excessive visual focus on individual muscles or body weight;
- marked dissatisfaction with one's physique.

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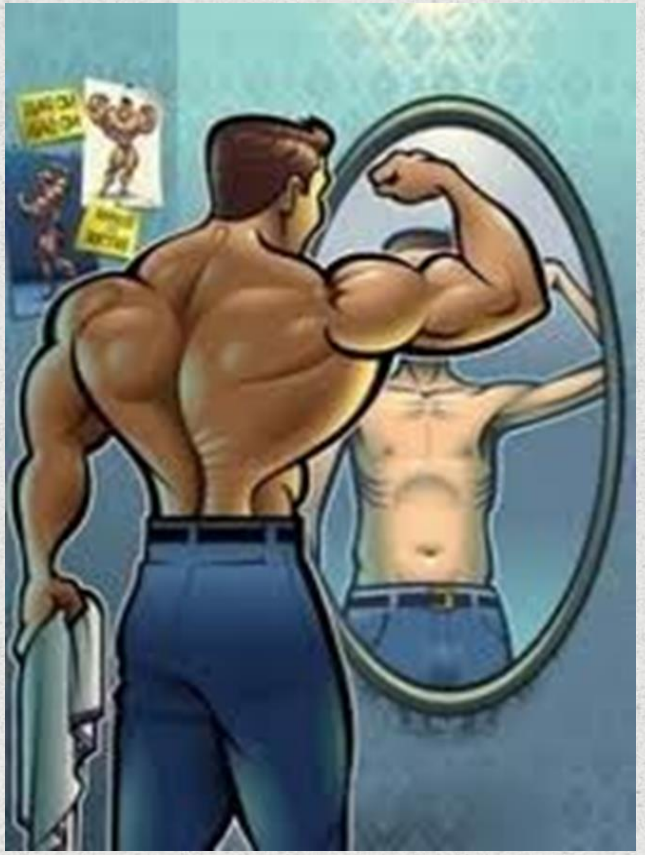
- Individuals suffering from vigorexia often tend to **consume low-calorie foods** and/or **abuse dietary supplements**.
- Individuals affected by vigorexia are **more prone to using illicit substances**, such as doping, in a compulsive pursuit of physical perfection, to stimulate hypertrophy and accelerate muscle recovery, allowing them to train more frequently and at higher intensity (this phenomenon is especially observed in bodybuilding).



Body Dysmorphic Disorder: It falls within the obsessive-compulsive spectrum chapter of the DSM-5 and is defined as a disorder characterized by extreme preoccupation with one or more perceived defects in physical appearance, accompanied by distorted perception, repetitive behaviors, and high social impact.

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Drunkoressia: a term not yet officially included in diagnostic manuals such as the DSM-5, but widely recognized in clinical settings to describe a dysfunctional eating behavior linked to **alcohol use**.

- Extreme caloric restriction (fasting or semi-fasting) practiced during the day to "compensate" for the calories to be consumed in the evening through alcohol intake.
- The affected individual aims to prevent weight gain and accelerate the intoxicating effect of alcohol (which enters the bloodstream much faster on an empty stomach).
- It is often associated with intense body image anxiety and low impulse control, representing a dangerous intersection between an eating disorder and substance dependence.

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Disorder	What the coach must recognize
Anorexia	Restriction + fear of gaining weight + denial
Bulimia	Binge eating episodes + "disappearances" + punitive exercise
BED	Uncontrolled eating + shame
ARFID	Extreme food selectivity with impact on growth/energy
Orthorexia / Athletic anorexia	“Eating clean” that becomes rigidity

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