



RELATIVE ENERGY DEFICIENCY IN SPORT RED-S



What Is Relative Energy Deficiency in Sport (RED-S)?

RED-S is a collection of clinical symptoms resulting from an insufficient energy intake relative to the athlete's training load. It is a syndrome that can affect all athletes, of any age and any gender, especially those in sports such as track & field and endurance events (i.e. road running, mountain/ultra/trail running), where proper energy fueling is critical for health and performance.



Why is RED-S harmful?

It impacts both physical and mental health and is associated with higher injury and illness risks. It reduces the quality of training and performance.



What Causes Relative Energy Deficiency in Sport (RED-S)?

RED-S is caused by **low energy availability**, which results from an imbalance in the energy the athlete takes in from food relative to the energy the athlete expends during exercise. It can have a range of effects on training quality, mental health, and physical well-being.



When Can it Occur?

RED-S can occur at any time when the athlete is in an energy deficit. This situation can occur as a result of **increased** training load (volume and/or intensity) and/or inadequate energy intake. This state can occur for a number of reasons, such as suboptimal timing of fueling (even when total daily intake is adequate), intentional restriction of food to manipulate body shape and weight, or a mental/physical illness preventing the athlete from consuming an adequate amount of food. RED-S can occur at any point in an athlete's career.

Possible Health Consequences:



- Decreased bone density
- Iron deficiency
- Increased risk of illness
- Increased risk of injury
- Depression and anxiety

Possible Performance Outcomes:



- Decreased muscular strength
- Decreased endurance
- Decreased concentration
- Decreased coordination
- Impaired judgement

Behavioural Signs & Symptoms:



- Intentional restriction of food that is not monitored or recommended by a professional
- Exercising while injured despite recommendations to modify activity
- Intense/severe preoccupation with body weight, size/shape, and performance
- Excessive, compulsive, or rigid exercise routine beyond that recommended for training or performance

Physical Signs & Symptoms:



- Recurrent injuries (i.e. stress fractures, muscle strains)
- Unusually prolonged recovery from minor injuries
- Persistent fatigue or complaints of being overly tired
- Irregular menstrual cycle in females (absence of menstruation for over 3 months, delayed onset of menstruation, or stalled puberty)

What Can Coaches & Parents Do:



Educate:

Help prevent incidences of RED-S in athletes by informing them of the risks to performance and health posed by low energy availability. Familiarize yourself with resources in your community.



Observe:

Monitor the athlete for the signs listed above. Note any changes in athletes' habits, attitudes or performances in practices or competition.



Communicate:

If you observe signs of RED-S in an athlete, encourage them to seek medical attention from their family physician or a sports-medicine physician. Note that it is not your role to diagnose RED-S in athletes.



Support:

Recovery from RED-S will likely involve long-term behavioural changes on the part of the athlete. It is important that athletes adhere to the recovery program prescribed by their healthcare team. Support the athlete by ensuring they are following the return to sport plan.

Find a Local Sports Medicine Physician

Through the Canadian Association of Sport & Exercise Medicine (CASEM) locate a Sport Medicine Physician in your local community.