Sports, Cardiovascular, and Wellness Nutrition
a dietetic practice group of the Academy of Nutrition and Dietetics

Recognition + Treatment of Deficient Energy Intake Among Athletes

A FACT SHEET FOR REGISTERED DIETITIANS/ NUTRITIONISTS WORKING WITH ATHLETES SUFFERING FROM AN EATING DISORDER AND/OR RELATIVE ENERGY DEFICIENCY

Registered Dietitians (RDs) who work with active people and athletes recognize the deleterious effects of energy deficiency on health and performance. The International Olympic Committee (IOC) introduced the syndrome[1], *Relative Energy Deficiency* in Sport (RED-S), in 2014 to emphasize recognition of risks described in the *Female Athlete Triad* to include males and various ethnicities. RED-S introduces a hub and spoke diagram to illustrate the interplay of physiologic and psychological dysfunction and morbidity, and utilizes a stoplight ('Red Light-Yellow Light-Green Light', representing high-risk, moderate-risk and low-risk athletes, respectively) as a simple means of representing to athletes the general pattern of return-to-play. Consumption of inadequate energy to meet nutritional needs may be acute or chronic and relate to decreases in appetite, lack of understanding regarding need, poor diet selection, seasonal variability, travel, time management, planning and preparation, fad diet trends and disordered eating or eating disorders (DE-EDs). DE-EDs are prevalent in sport and may accompany a deficient energy intake, through either initiation or exacerbation of under fueling. While any athlete may be at risk, DE-EDs are most common in endurance, weight sensitive, aesthetic[2], and gravity defying sports.

DIMENSIONS OF ENERGY DEFICIENCY

Physical Risks of Energy Deficiency[1]	Psychological Risks of Energy Deficiency*
GROWTH + DEVELOPMENT	DEPRESSION
CARDIOVASCULAR	ANXIETY
GASTROINTESTINAL	FATIGUE
IMMUNITY	ISOLATION
ENDROCRINE	OBSESSIONS
REPRODUCTIVE	MOODINESS
SKELETAL	SELF-HARM + SUICIDAL IDEATION OR BEHAVIORS
METABOLIC	INTERPERSONAL RELATIONSHIP CHALLENGES
HEMATOLOGICAL	

** Psychological risks may precede or succeed inadequate energy intake*

Nutritional Interventions, Outpatient Nutrition + Key Tips are explored on the following page.

NUTRITIONAL INTERVENTION

- Recognize the necessity for medical assessment from a physician experienced in DE-ED. Consider the risks of malnutrition based upon the age of the athlete, resources available, and strength of the treatment team. Utilize the red-yellow-green stoplight as a metaphor to describe 3 levels of risk and explain level of participation in activity that supports recovery to athletes.[1,2]
- Address energy deficiency and DE-EDs with urgency and aggressively, especially among children & adolescence to reduce risk to growth and development.
- Establish a nutritional intake that supports optimal functioning, provides balanced and adequate macro- and micronutrient intake, maintains body weight within a healthy range, improves bone health and rehabilitates disordered eating or an eating disorder.
- Physical activity may progress contingent upon nutritional intake and medical status. Assess the motivation for activity/sport participation. Evaluate ongoing risk, including the sports environment, support systems and sources of accountability when considering a return to activity.
- Continue to monitor and evaluate the athlete for remission and risk for health and psychological risks. The 2014 Female Athlete Triad Coalition provides clinical guidelines for healthcare providers on medical management and recommendations for return to play, including a Cumulative Risk Assessment tool.[3]
- Recognize that risk for fracture is prolonged beyond weight restoration and may precede measurable bone density loss as early as adolescents.[4]

OUTPATIENT NUTRITION INCLUDES, BUT ARE NOT LIMITED TO:

1. Adjustment of nutritional intake to meet changing metabolic needs, activity, growth and development. *Note that the hypermetabolic rate commonly found among those suffering from DE-ED may continue for months beyond weight stabilization.*
2. Utilization of a span of weight checks to draw conclusions regarding stability or progress. Use urine specific gravity as a potential sign of fluid loading or dehydration.
3. Distinguishing the "athlete's heart rate" from metabolic down regulation. Compare resting pulse (sitting), standing pulse and pulse with minimal exertion (walking across the room). The trained athlete will have little, if any, difference in heart rate. Bradycardia results from increased vagal tone with underweight; tachycardia at minimal exertion is due to deconditioning and the weakness of malnutrition.[5] When weight has been maintained in a healthful range, consider incremental additions to physical activity, with continued monitoring. **Resist pressure to return the athlete to activity prematurely**. Communicate to the athlete, and perhaps their parent, that you are unwilling to risk the athlete's health and future.
4. Development of a protocol or individual contract for treatment and steps to take in the event of a lapse or relapse. Refer to the IOC RED-S Clinical Assessment Tool, and the Female Athlete Triad Cumulative Risk Assessment Tool and sample athlete contract[3] for clearance and ready to play decisions.

SUMMARY

The information provided is intended to assist nutrition professionals as members of the multidisciplinary team in the recognition, treatment and prevention of deficient energy intake. When an eating disorder is present, utilize the experience of disordered eating professional(s) within your multidisciplinary team for guidance and reach consensus in treatment.

Body composition (BC) goals and analysis deserve careful consideration. BC analysis is frequently performed in sport. In fact, analysis of BC may trigger a distrust of one's body and perceived need for external monitoring. This is important to consider given the lack of training in BC analysis, the lack of evidence to support performance enhancement based primarily upon BC, and the strong possibility that a BC analysis may prove to be iatrogenic/detrimental[6]; Honor primum non nocere—above all, do no harm!

The neurological basis of disordered eating is not well understood. Current evidence suggests that interoceptive awareness and/or mindfulness may be inadequate to direct food intake.[7] Athletes often bring a coachable attitude to nutrition therapy. Provide clear structure in planning for fueling events (meals and snacks) in recovery from DE-ED. Utilize clinical assessment tools and refer to the return to play guidelines[1,2] to support the coaching staff, treatment team and athlete in safe progression in physical activity and sports participation.

References

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