

Fueling for Success: Relative Energy Deficiency in Sport

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Disclosure

I have the following financial relationships to disclose:
Abbvie, Speaker's Bureau, Migraine

All relevant financial relationships have been mitigated


Objectives

- Define and discuss epidemiology of Relative Energy Deficiency in Sport (RED-S).
- List current gaps in care related to identification of RED-S for recreational athletes and orthopedic patients.
- Describe members of the multidisciplinary team for treatment of RED-S.
- Identify body systems impacted and consequences of RED-S.
- Review how nutrition affects rehabilitation outcomes for athletes.

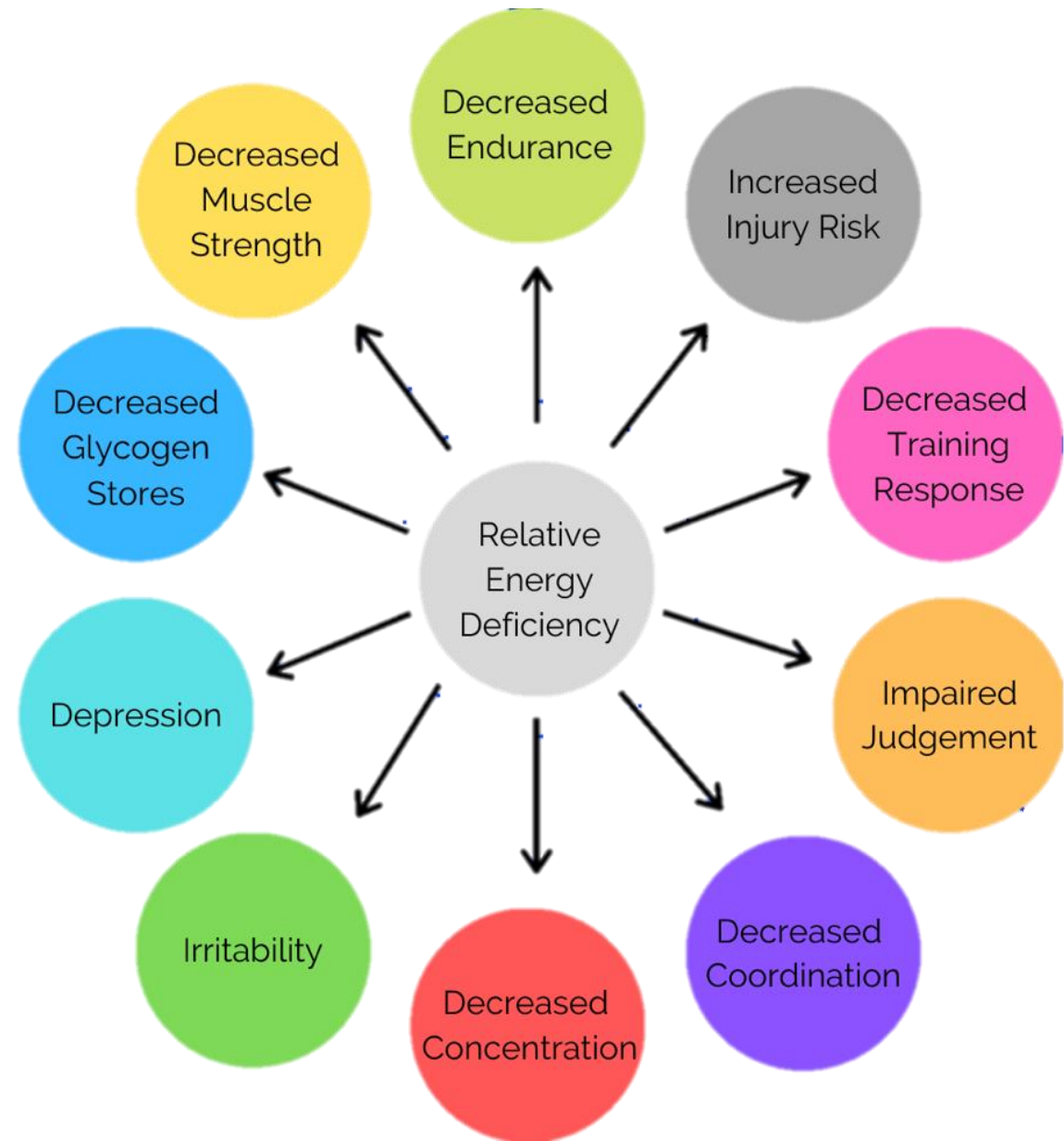
DEBUNKING MYTHS

- Is there an “ideal” nutrition strategy for athletes?
- Are only competitive athletes at risk for RED-S?
- Losing your period is a normal part of training
- I don't want to gain weight while I am injured, so I will cut back on intake
- I eat multiple times a day, so I can't be in an energy deficit

Key Components for Athlete Nutrition

1. There is no ideal nutrition approach for athletes, it is both individual and sport-specific
 2. Under-fueling can lead to multiple physiologic changes and health issues
 3. Supplements can be beneficial, but these should be individualized and assessed for safety/quality
 4. An ortho rehabilitation treatment plan should include nutrition discussion
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What is RED-S?



Relative Energy Deficiency in Sport

Formerly known as the female athlete triad (weight loss, amenorrhea, and stress fracture/osteoporosis)

2009: International Olympic Committee defined RED-S to be inclusive of both genders and identify the constellation of consequences

What's the root cause?

Low energy availability (EA): imbalance of Energy intake (EI) and Energy expenditure (EE)



Gaps in care

Recreational athletes often do not identify as “athletes”

Under-recognition of relationships among nutrition and related health effects that impact performance and general health

Cultural emphasis on dieting/weight loss

Lack of education for medical providers to identify energy deficits or address nutrition concerns with athletic patients

Identification

- Screening for RED-S
- Who is at risk?
- Is incidence increasing?
- Communication style
- Labs and tests to consider



Signs and Symptoms



- GI upset, constipation, bloating
- Amenorrhea
- Frequent injuries
- Stress fracture
- Sleep disturbance
- Hypotension
- Fatigue
- Bradycardia
- Cold intolerance
- Weight changes
- Decreased performance
- Anxiety/Irritable
- Depression
- Hair Loss
- Dry Skin
- Lightheaded/Dizzy

Labs to Consider

CBC, CMP, Iron, Ferritin, Lipid Panel, TSH, Vitamin D, B12

Lab Interpretation to Assess for:

- Low iron and/or ferritin (can occur with normal Hgb/Hematocrit)

- Low vitamin D

- Low B12

- Elevated liver enzymes

- Low blood glucose

- Elevated cholesterol

- Low folate (more common in vegetarians/vegans)

- Elevated TSH

Bone Health

DEXA (Dual-Emission X-ray Absorptiometry):
recommended following
stress fracture OR
amenorrhea for >6 months

Consider for those with
disordered eating or
oligomenorrhea

Ensure adequate calcium
and vitamin D intake

Osteoblasts and
Osteoclasts

Can bone density be
improved?



Menstrual Health

Primary amenorrhea

Secondary amenorrhea

There is no specific formula for how or severe long energy deficit needs to be for amenorrhea to occur

Birth control is not recommended as treatment of amenorrhea

FitRWoman app- resource

Sleep = Recovery

- Timing of nutrition & exercise
- Avoid evening caffeine, alcohol, excess fluids
- Carbohydrate evening snack
- General under-fueling
- Supplements (e.g. magnesium)



Injury Risk: The Body Needs Fuel!

Intake is Needed for:

- Glycogen stores
- Muscle strength
- Mitochondria in muscle fibers
- Ability to recover

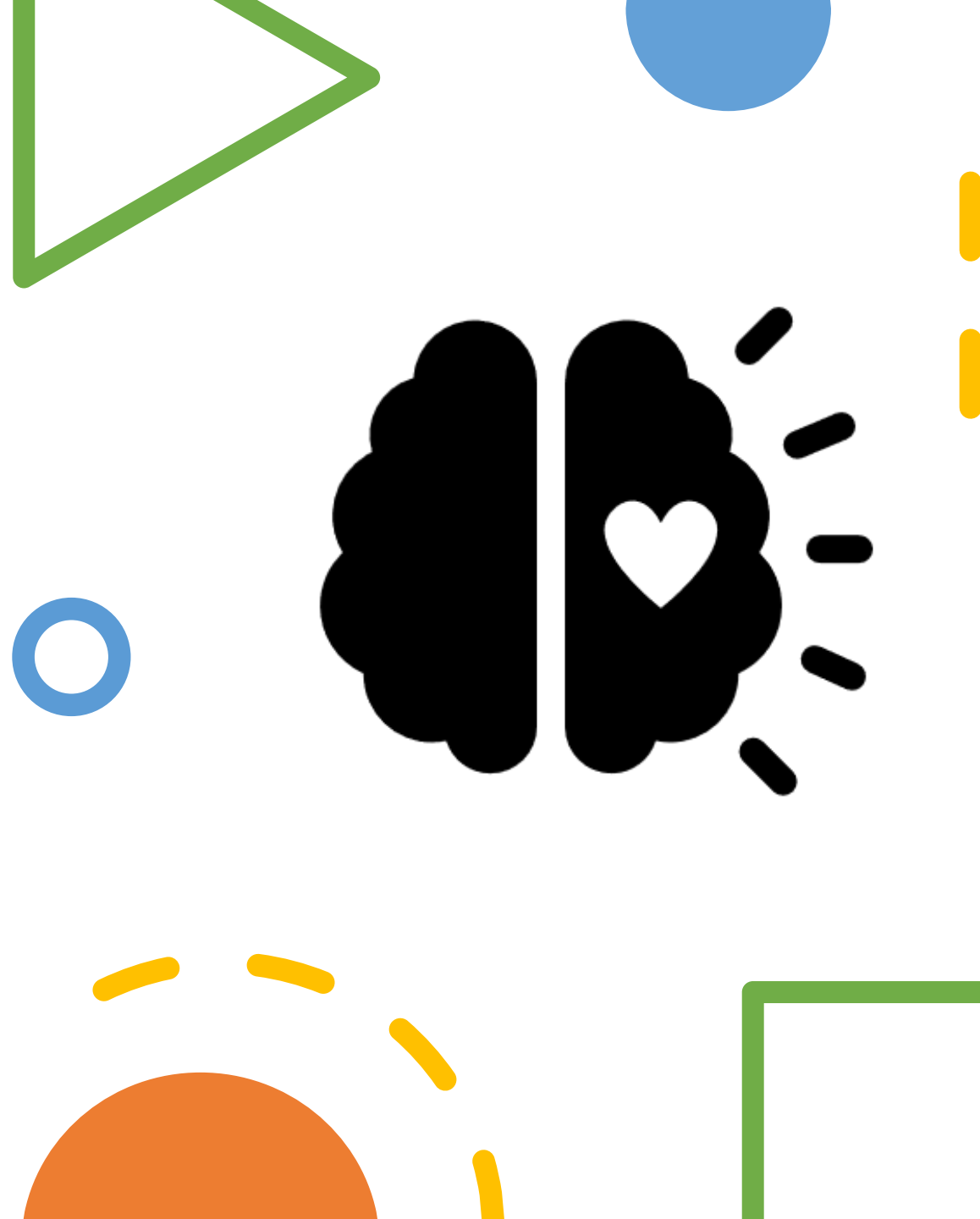



Inadequate Fueling Leads to:

- Decreased training response
- Difficulty with concentration and coordination
- Mood changes
- Decreased endurance/performance
- Injuries

Mental Health

- RED-S can occur with or without disordered eating
- Assess for cutting out food groups, social interactions impacted by food, weight changes
- Eating Disorder Screen for Primary Care (ESP)
- SCOFF questionnaire





Disordered eating
or lack of nutrition
awareness?

Significant component is the individual's thoughts and feelings about food

Method for assessing = how does the athlete respond to nutrition recommendations?

A person without disordered eating will be motivated to work with a dietician to follow recommendations and increase intake. If there is anxiety and fear associated with increasing calories and weight, disordered eating may be present.

orthorexia

Term developed in 1998

Obsession with “clean” or “healthful” eating

No formal diagnostic criteria, though often correlated with obsessive-compulsive disorder

Goes beyond balanced awareness of nutrition to unhealthy fixation of “healthy eating

Signs/Symptoms: compulsive checking of food labels/ingredients, cutting out entire food groups, many rules about what is “healthy” to consume, spending long periods of time focused on what will be available to eat when away from home

RED-S Treatment Team

Registered Dietician

Primary Care Provider

Mental Health Provider/Therapist

Coach

Physical Therapist

*Not every athlete needs all of these providers for recovery



Nutrition approaches

Balanced nutrition is beneficial for all athletes

Sport-specific focus should be guided by a registered dietician and/or experienced coach

Periodized nutrition: strategic combination of nutrition + exercise for optimal training and performance

Within a specific sport, there are considerations for pre-workout or race, during workout, and post-workout

Supplements

Which supplements to utilize should be individualized

How to assess safety and quality of supplements? The following organizations provide quality testing:

1. ConsumerLab.com
2. NSF International: www.nsf.org
3. U.S. Pharmacopeia: www.usp.org

Ortho Rehab

Applies to sport injury and orthopedic procedures

Nutrition interventions are not commonly included in rehab interventions

Synergistic with other rehab modalities and support healing

Caloric needs after injury

Protein to support muscle repair (amino acid demand)

Bone turnover needs



Rehab:
nutritional
targets

Calories

Protein/amino acids

Carbohydrates

Fatty acids

Supplements



resources

Find a Registered Dietician via the Academy of Nutrition and Dietetics

<https://www.eatright.org/find-a-nutrition-expert>

For athletes with disordered eating, therapist who specializes in eating disorders

The Eat for Endurance podcast and PHIT for a Queen podcast

Finding your Sweet Spot by Rebecca McConville, RD

Sick Enough by Jennifer Gaudiani, MD

No Period, Now What, Dr. Nicola Rinaldi

Run Fast Eat Slow – Cookbook series that includes specific nutrition for athlete issues and healing

Sport Mom United- sportsmomsunited.com

Let's review

Energy balance is a key component of athlete health and performance

History regarding nutrition should focus on patient goals and values- ask them to tell you their story

Energy availability directly impacts sleep, mood, performance, recovery, and multiple body systems

Significant health consequences can result from RED-S

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Thank you!

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Personal image, Laurel Short