Sports Nutrition for Young Athletes

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Introduction

Paula Mrowczynski-Hernandez MEd, RD, CSSD
Pediatric Dietitian since 2004

- Started as a Pediatric Dietitian at Texas Children's Hospital Wellness Center
- Then in 2006 I started working in the Gastroenterology and Hepatology outpatient Clinic at Texas Children's Hospital until 2015

Sports Dietitian (officially CSSD since 2/2017)

- Working with athletes of various ages and skill levels since 2008
- In 2015 started working with IRONMAN athletes at Memorial Hermann IRONMAN Sport Medicine Institute.
- This also included working with football players, volleyball players, baseball players, equestrians, Jujitsu athletes, gymnasts, swimmers, runners, triathletes, competitive fencing
- Why am I telling you all this?

The First Time I Gave a Talk to a Texas High School Football Team

- **PowerPoint with LOTS of great information**
- **Discussed Benefits of Fueling**
- **Gave Examples of meal and snack idea**s
  - Keep them realistic, simple and easy
  - Do not assume the athletes have the ability to buy any foods you suggest
- **Address supplements**
- **Did not ask the athletes about them**

Topics of Discussion

What is Sports Nutrition?

Stages of Development

Considerations in Fueling

Hydration

Teaching methods

Supplements

RED-S (Relative Energy Deficiency in Sport):

Low Energy Availability/Eating Disorders

What is Sports Nutrition?

- Food, fluids and nutrition to support the additional daily activity and training of athletes.
- Goal of the sports nutrition plan is to support the athletes training plan and recovery.

Considerations in Fueling Training Volume

- Soccer 1-2 times a week for 60 minutes.
- Gymnastics 1-2 times a week for 60 minutes.
- Basketball 1-3 times a week for 60 minutes.
- Dance daily 5 days a week at school 45-60 minutes.
- Football 60 minutes 5 days a week at school.

Consider Level of Training and Volume

- Soccer 5 times a week for 120 minutes and weekend games 1-2 hours.
- Gymnastics 4 hours a day 5-6 days a week.
- Running 3-6 miles 5-6 days a week + strength training 2 -3 times a week.
- Football 2 hours a day 5 days a week and additional training outside of school.

Psychosocial Processes and the Stages of Adolescent Development

	Early Adolescence (ages 11-14)	Middle Adolescence (ages 15-17)	Later Adolescence (ages 18-21)
Emotionally related	Adjustment to a new body image, adaptation to emerging sexuality	Establishment of emotional separation from parents	Personal sense of identity, further separation from parents
Cognitively related	Concrete thinking, early moral concepts	Emergence of abstract thinking, expansion of verbal abilities & adjustment to increased school demands	Development of abstract, complex thinking
Socially related	Strong peer effect	Increased health risk behaviors, sexual interest	Increased impulse control, emerging social autonomy

Tanner Stages of Adolescent Development

Females:

Stage 1: Pre-pubertal: no pubic hair; Linear growth 5-6 cm (2-2.4 in.)

Stage 2: Breast bud stage with elevation of breast. Girls show a rise of growth hormone levels at this stage. Sparse growth of pubic hair. Growth in height: 7-8 cm (2.8-3 in).

Stage 3: Further enlargement of breast. Increased amount of pubic hair. Linear growth 8 cm (3 in.)

Stage 4: Areola/papilla form. Pubic hair similar to adult. 7 cm(2.8 in)

Stage 5: Mature stage. Adult pubic hair. No further growth in height ~16 years of age

Females:

- Dramatic change in body fat during puberty
- Average body fat levels increase from 16-27%
- Dramatic changes in body shape and size can lead to poor body image or self-esteem, and disordered eating patterns.
- Might be tempted to try diet pills, supplements or unhealthy eating behaviors

Tanner Stages of Adolescent Development

Males:

Stage 1: Pre-pubertal: no pubic hair; Linear growth 5-6 cm (2-2.4 in.)

Stage 2: Enlargement of scrotum and testes, sparse growth of body hair. Linear growth 5-6 cm (2-2.4 in.)

Stage 3: More growth of pubic hair. Linear growth 7-8 cm (2.8-3 in.)

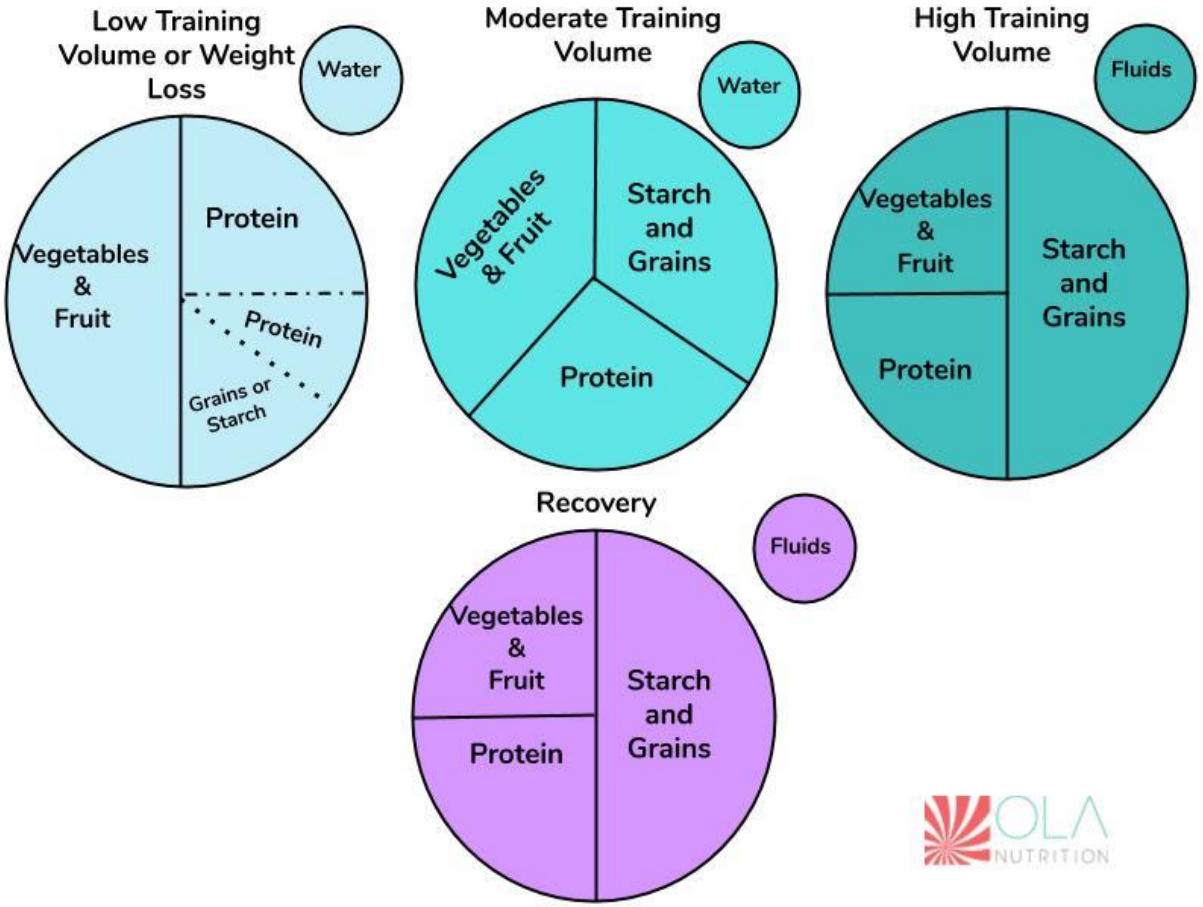
Stage 4: Significant rice in growth hormone levels. More pubic hair similar to adults. Linear growth 10 cm (4 in.)

Stage 5: Adult genitalia. No further growth in height (~17 yr)

Males:

- Males tend to gain lean mass and decrease their body fat during puberty.
- Testosterone is the main hormone responsible for muscle growth during puberty.
- Males who develop later or go through puberty later might compare themselves to teammates gaining larger muscles faster or more despite similar training.
- May be tempted to try anabolic steroids.

Fueling Daily Activities and Training



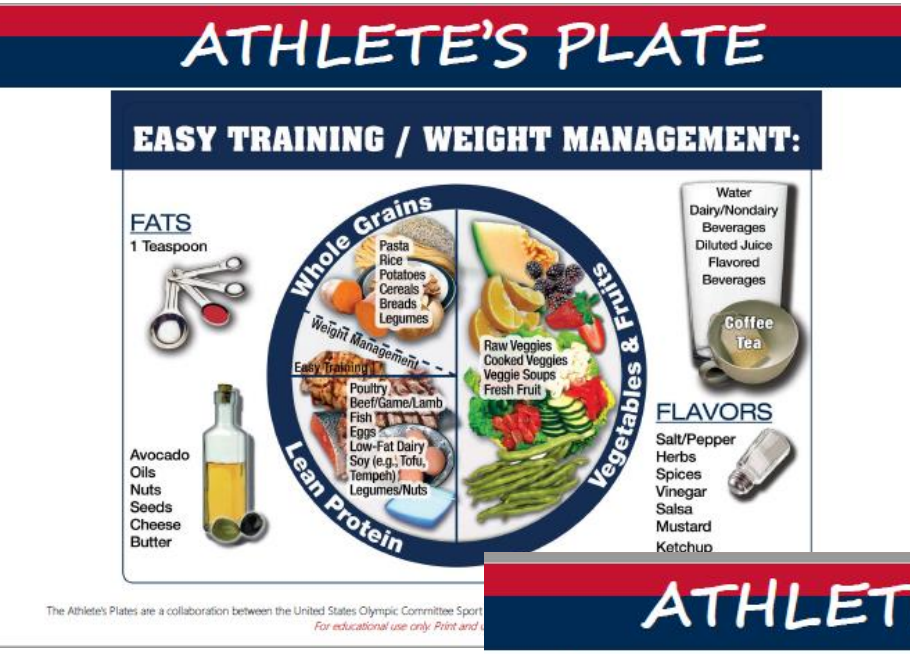
Carbohydrate Sources

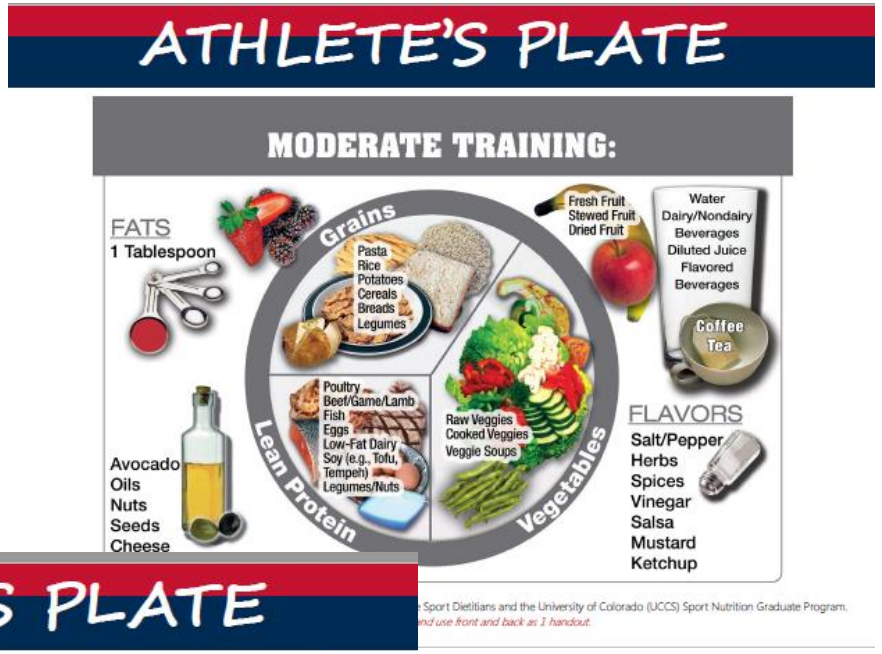
Food	Portion	Carbohydrates
Apple	8 oz.	30 g
Bagel	½ Bagel	30 g
Banana	8 oz.	30 g
Bread	2 Slices	30 g
Corn	1 Cup	30 g
Dried Fruit	4 Tablespoons	30 g
Honey	2 Tablespoons	30 g
Pasta	2/3 Cup Cooked	30 g
Potato (Baked)	6 oz.	30 g
Rice	2/3 Cup Cooked	30g
Sports Drink	~20 oz.	30 g

Protein Sources

Food	Portion	Protein Amount
Beef/Poultry/Fish	3 oz.	~ 21 g
Cottage Cheese	1 Cup	~ 25 g
Eggs	3 Eggs	~ 21 g
Legumes (Beans/Lentils)	1 Cup	~ 20g
Milk	2 Cups	16 g
Milk (Almond)	1 Cup	1 g
Milk (Soy)	1 Cup	7 g
Peanut Butter	2 Tbsp.	8 g
Greek Yogurt	1 Cup	~ 20 g
String Cheese	2	~ 15 g

Team USA FREE Nutrition Fact Sheets





The Athlete's Plates are a collaboration between the United States Olympic Committee Sport Dietitians and the University of Colorado (UCCS) Sport Nutrition Graduate Program.
For educational use only. Print and use front and back as 1 handout.

Hydration

Dietary Reference Intakes for Water		
	Males	Females
Ages 9-13	2.4 Liters= 10 cups	2.1 Liters=9 cups
Ages 14-18	3.3 Liters = 14 cups	2.3 Liters =10 cups

Monitoring fluid intake and urine color

Fueling Activities Before Training or Competition

1.5-3 hours before:

- ½-1 sandwich and fruit
- Cereal and fruit
- Granola bar and fruit
- Nut butter sandwich and fruit
- Pasta or rice and a little chicken
- Oatmeal and fruit

30 min before:

- Banana
- Dried fruit (as tolerated)
- Sports drink
- Energy gel/chew
- Graham crackers
- Pretzels
- Orange

Fueling Before, During, and After

Before

2-3 hours before

- Pasta & chicken
- PB and banana Sandwich
- Oatmeal with fruit

Less than 60 min before: sports drink, banana, graham crackers, gel, chew or energy bar, potato

During

- Water
- Water with electrolytes
- >60-90 min
- Sports drinks
- Gels, chews, sport beans
- Pretzels
- Fruit
- Crackers

After

- Greek yogurt + honey + banana
- Turkey or nut butter sandwich
- Smoothie made with fruit and milk or protein powder
- Scrambled eggs with toast or tortilla(s) and avocado

Recovery Options

Nutrition for Recovery: Post Exercise/Training Protein source + Carbohydrate source			
Protein (14-20 g)	**Carbohydrates (15-30g)**	**Protein (20-30 g)**	**Carbohydrates (45-60 g)**
2 eggs	1-2 corn tortillas	3-4 eggs	2 x 8" tortillas
½-1 cup Greek yogurt	½-1 banana or 1-1.5 cups of berries	1.5 cups Greek yogurt	1.5-2 cups of cooked oatmeal
1 cup of beans/lentils	1 small - medium potato	1.5-2 cups beans/lentils	1 large potato
2-3 oz of cooked chicken or meat or fish	½-¾ cup cooked quinoa	3-4 oz of chicken or meat or fish	1-1.5 cups of rice
½ cup nuts or 4 Tbsp nut butter	1-2 slices of bread or English muffin	½-¾ cup firm tofu	1 medium bagel

Forming a Plan with the Athlete

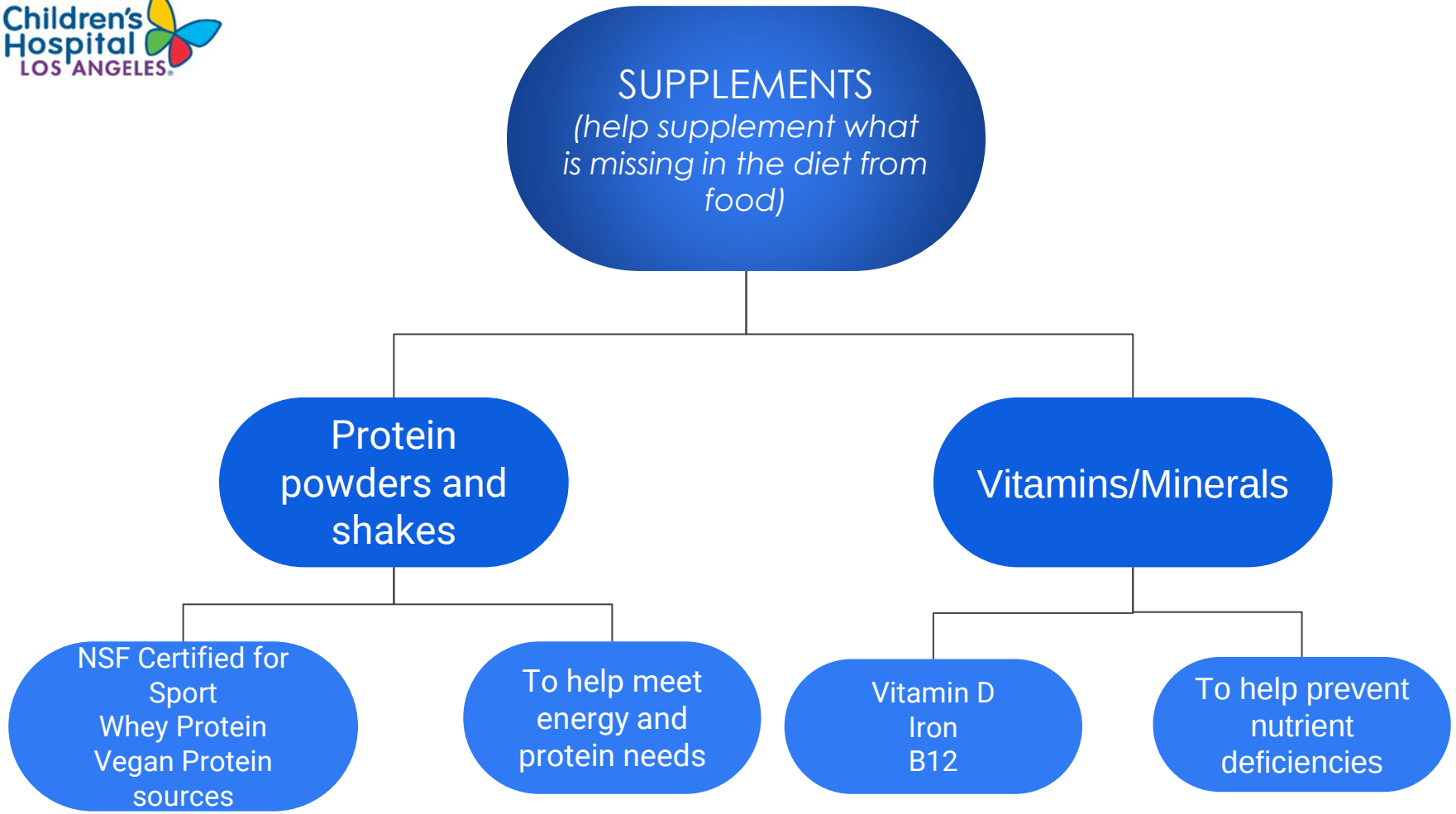
Get to know the athlete

- What is the sport they play
- How often is training
- How often are competitions or events
- Food preferences/allergies
- Daily schedule
- What foods to they enjoy
- Do they hydrate during the day
- How is sleep and recovery
- Supplements?
- Medications?
- Health history?

Sample Plan

- Wake up 6 am
  - **7 am** Water, smoothie or milk with toast (2) and eggs (2) and banana
  - **11-12 PM** Lunch: PB sandwich with fruit on the side + water
  - **3 PM** Snack: Granola bar and milk or smoothie or trail mix
  - Water and fruit or granola bar during practice
  - **6 PM** 1.5 cups rice, salmon or chicken and salad or vegetables or 2-3 tacos

- Wake up 4-5 am
  - **5:30 am** Water, smoothie or graham crackers and PB or banana
  - **7-8 am Cereal with milk and almonds or PB sandwich or granola bar with milk**
  - **12 noon: Sandwich or wrap with turkey or chicken or school lunch with water and fruit**
  - **3 PM** Snack: Water and trail mix
  - **6 PM 1-2 cups spaghetti with meat balls and cooked green beans and water**



Most research on supplements is on adults (not children or adolescents)

Is it safe for growing athletes?

Is it proven effective for growing athletes?

Is it contaminated?

Is it worth the risk?

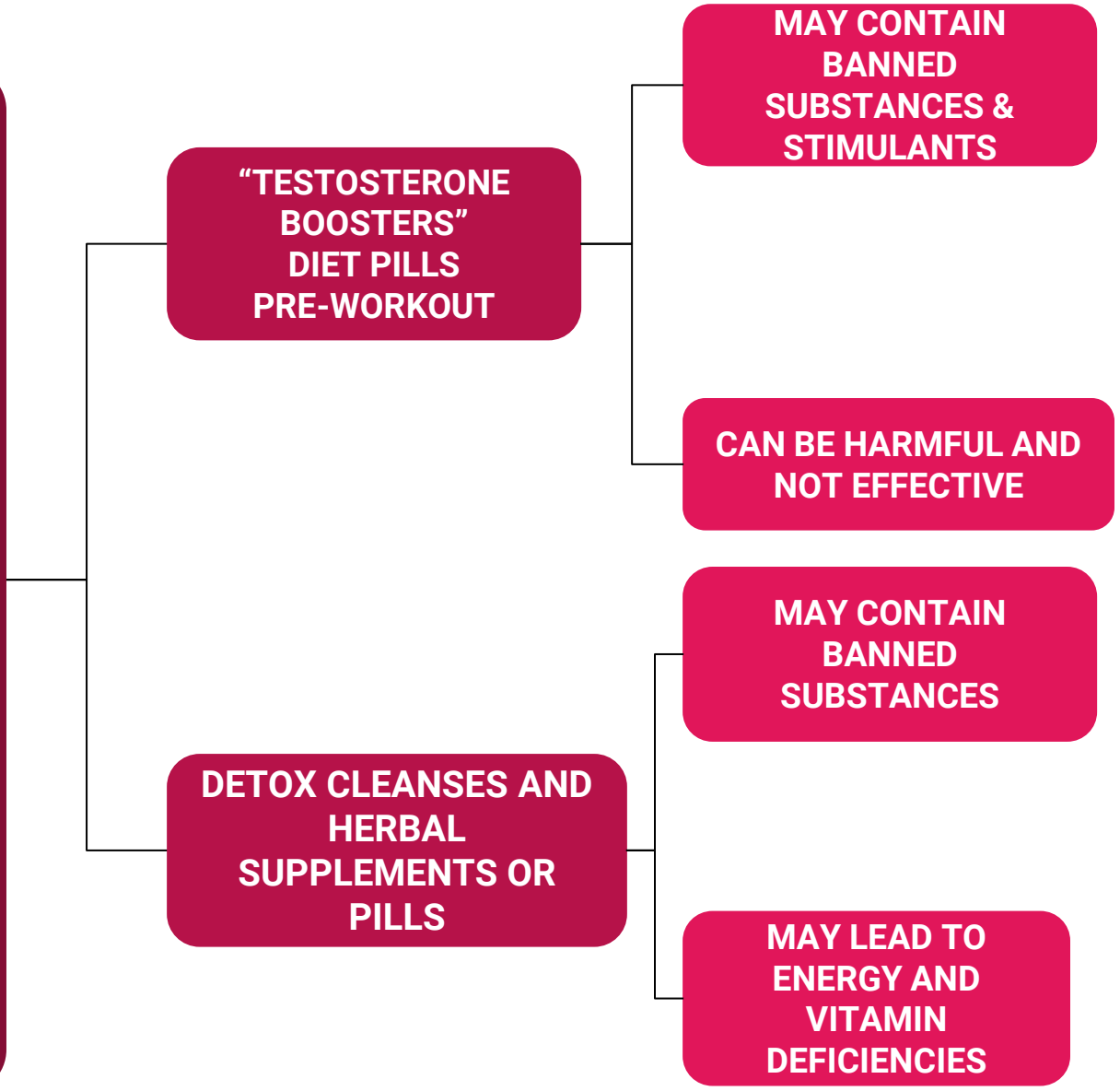
Resources
Reliable Information on Supplements

- Sport-Specific Agencies/Organizations:
  - Drug Free Sport
    - www.drugfreesport.com
  - Supplement Safety Now
    - www.suplementsafetynow.com
  - World Anti-Doping Agency
    - www.wada-ama.org
  - TrueSport of the U.S. Anti-Doping Agency (USADA)
    - www.usada.org/truesport

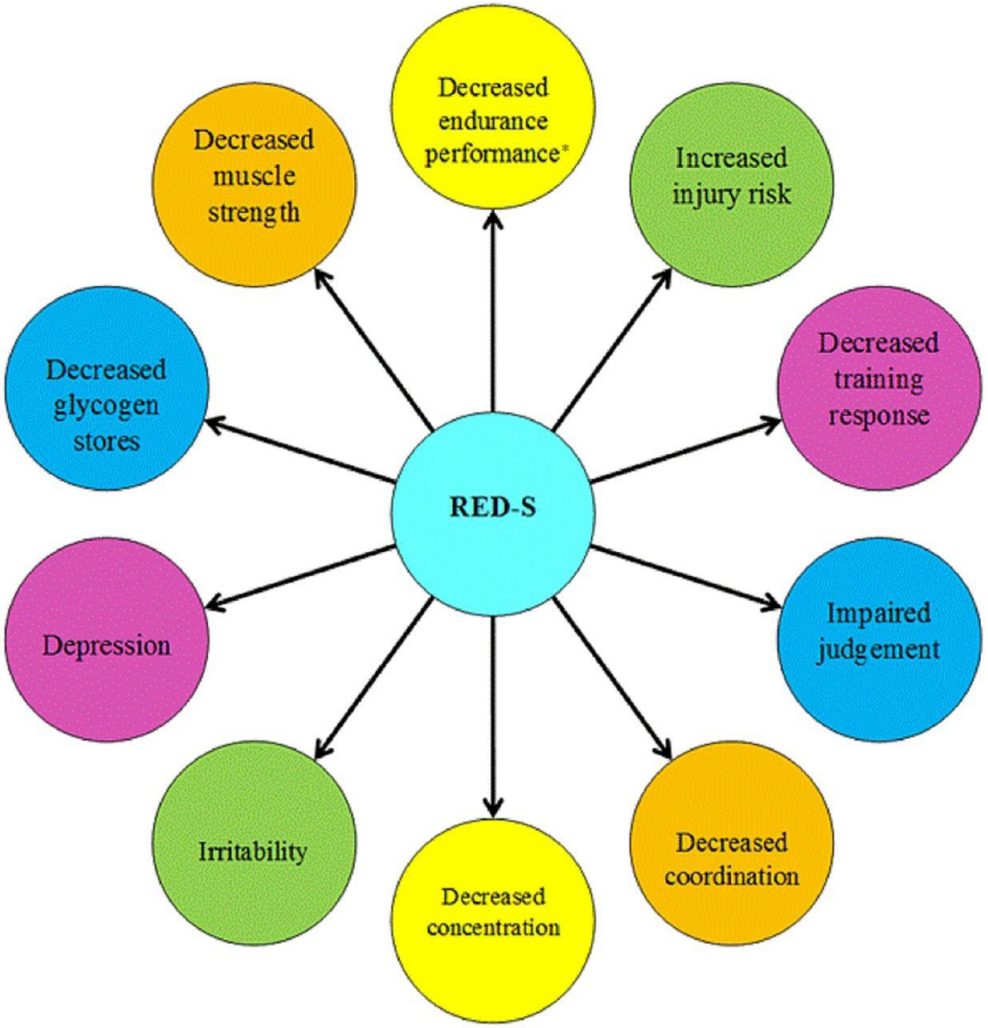
Resources: Organizations Addressing Supplement Purity

- Informed Choice www.informed-choice.org
- NSF, Certified for Sport Program www.nsfsport.com
- Banned Substances Control Group www.bscg.org
- Aegis Sciences Corporation www.aegislabs.com
- U.S. Pharmoacopeial Convention (USP) www.usp.org

CAUTION ABOUT SUPPLEMENTS



Potential Performance Effects of Relative Energy Deficiency in Sport (*Aerobic and anaerobic performance).



Margo Mountjoy et al. Br J Sports Med 2014;48:491-497

Signs and Symptoms of Low Energy Availability

Symptoms of Low Energy Availability		
Fatigue	Often ill or injured	Not able to gain muscle or strength
Anemia	Poor performance	Weight loss
Disordered Eating	Absent or irregular menstrual cycles	Gastrointestinal problems
Irritability	Depression	Training hard but not improving

Disordered Eating

- Anorexia Nervosa (AN)
  - Dramatic weight loss
  - Distorted body image
  - intense fear of gaining weight
  - Preoccupation with weight, calories, macronutrients
  - High levels of anxiety, depression or both
  - Feeling guilty after eating
  - Strict food rules
  - Excessive and compulsive exercise

Disordered Eating

- Bulimia Nervosa (AN)
  - Evidence of bingeing
  - Eating in private or hoarding food
  - Evidence of purging
  - Weight fluctuations
  - Excessive and rigid exercise regimens
  - Abuse of laxatives, diet pills, diuretics
  - Complaints of sore throat, heartburn, or reflux
  - Feelings of shame and guilt (or both)

Healthy Eating Versus Orthorexia

Healthy Eating Habits	Orthorexia
May limit processed foods or added sugars.	Completely avoids and views processed foods or foods with added sugars as **OFF LIMITS.**
May try including more fruits and vegetables with meals.	Spends excessive amounts of time planning meals that are "healthy" or goes to extremes (only eat fruits/vegetables).
Aims to make healthy choices when eating out (Balanced meals-potato, fish or chicken and vegetables).	Avoids foods when eating out or foods prepared by others.
Plans meals a head of time or might meal prep.	Only eats foods that have been meal prepped and has anxiety or preoccupation with meal prepping.
Sometimes might skip dessert if not feeling like having something sweet but will enjoy sweets or desserts on special occasions or when wanting to have them.	Completely avoids sweets or desserts. Never has sweets or sugar.
Reads ingredients and is aware of those that might not be as healthy as others.	Obsesses over the ingredients in foods.

Know When To Refer

- If you do not feel comfortable working with someone with an eating disorder, refer to another dietitian specializing in eating disorders and team of specialists.
  - Dietitian, Psychologist, Medical Doctor, Social Worker, Nurse and possibly Physical Therapist
  - All team members should know of appropriately language to use with athlete and aim to communicate with parents, coaches, athletic trainers and team working with athlete.

Summary

- **Get to know the athlete**
  - their sport, daily schedule, food preferences and ability to access certain foods
- Find out what is realistic for fueling and training
- Educate on relevant information to help improve fueling, performance and recovery
- Educate about supplements as needed
- Be aware of signs of under fueling and identify room for improvement and help with applying recommendations

Resources and References:

- **American College of Sports Medicine, Academy of Nutrition and Dietetics, and Dietitians of Canada. 2016 Joint position statement. Nutrition and Athletic Performance. March 2016. Vol 1 (16-93).**
  - http://www.eatrightpro.org/~/media/eatrightpro%20files/practice/position%20and%20practice%20papers/position%20papers/nutritionathleticperf.ashx
- **Bratman, S., and Dunn, Thomas.2016. On orthorexia nervosa: A review of the literature and proposed diagnostic criteria. Eating Behaviors 21: 11-7.**
  - https://www.sciencedirect.com/science/article/pii/S1471015315300362
- **Mountjoy, M., Sundgot-Borgen, Jorunn, Burke, L., et al. 2014. The IOC consensus statement: Beyond the female athlete triad-Relative energy deficiency in sport (RED-S). British Journal of Sports Medicine 48 (7): 491-497.**
  - https://bjsm.bmj.com/content/48/7/491
- **CPSDA: Collegiate and Professional Sports Dietitian Association**
  - **https://www.sportsrd.org/**
- **SCAN: Sports, Cardiovascular and Wellness Nutrition: https://www.scandpg.org/home**
- **Team USA Nutrition Fact Sheets (FREE)**
  - **https://www.teamusa.org/nutrition**

Thank you!

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