

### Background

- Iron deficiency, with or without anemia, can affect athletic performance.
- Deficiency can impair muscle function and limit work capacity, leading to compromised training adaptation and athletic performance.
- Causes of compromised iron status include poor dietary iron intake, overall energy intake, periods of rapid growth, training at high altitudes, menstrual blood loss, foot-strike hemolysis, blood donation, or injury.
- During periods of intense training, increased iron losses may occur in sweat, urine, feces, and from intravascular hemolysis.

It's estimated that **30% of female athletes have iron deficiency** that could be negatively affecting athletic performance<sup>1</sup>.

Estimates also suggest that iron requirements may be **70% greater than the RDA** for iron<sup>2</sup>.

### Objectives

1. Assess iron status of athletes on the University of Washington women's rowing team and screen for iron deficiency.
2. Provide treatment to athletes determined to be iron deficient according to the UW Sports Nutrition protocol. Treatment includes:
  - a. Oral Supplementation
  - b. Dietary Intervention

### Methods

In April 2017, routine iron assessment was conducted among 38 athletes on the UW women's rowing team.

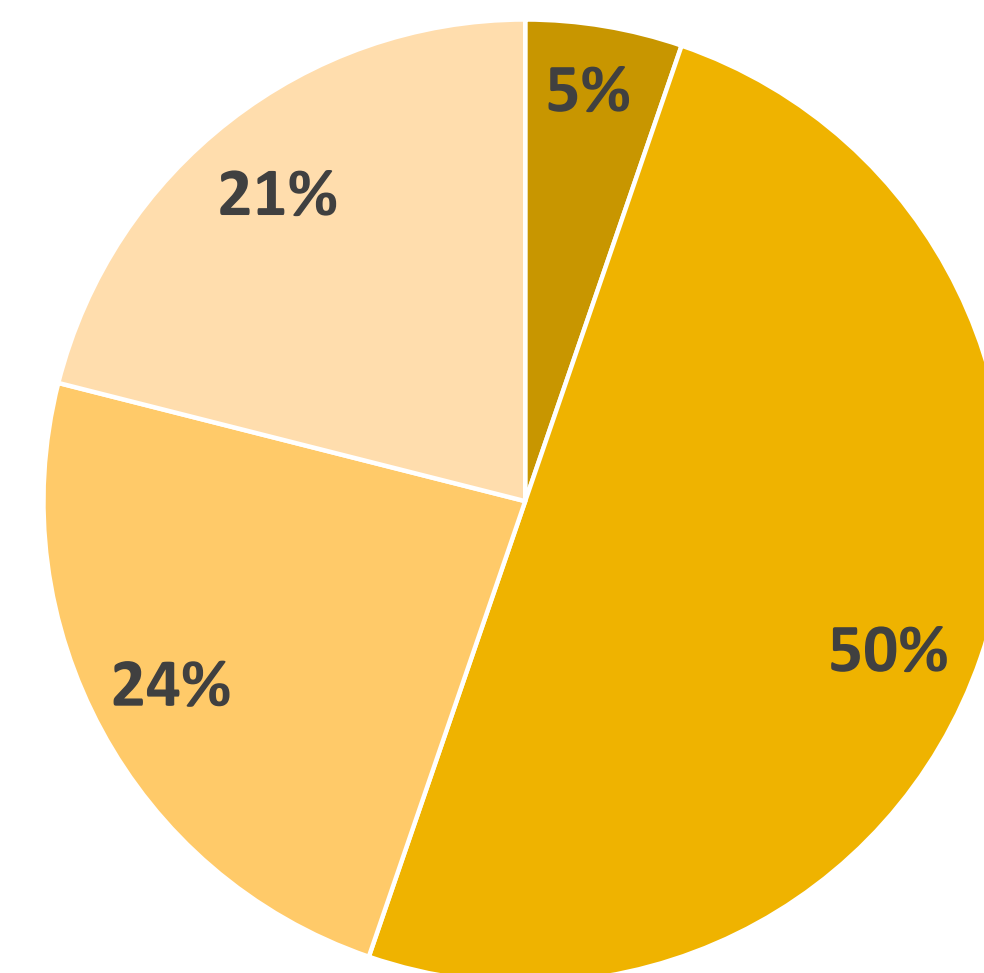
- Iron status was measured from non-fasting venous blood samples collected by the team physician.
- Serum ferritin, indicator of iron stores, classified rowers as iron depleted (sFer <35 µg/L) or normal (sFer > 35 µg/L).
- Athletes with iron deficiency without anemia were treated by the dietitian, and any athletes with anemia were referred directly to the physician for treatment.

Stage 1: Iron depletion	Stage 2: Iron deficient erythropoiesis	Stage 3: Iron deficient anemia
- <35ug/L ferritin	- <20ug/L ferritin	- <12ug/L ferritin
- >115g/L hemoglobin (Hb)	- >115g/L hemoglobin (Hb)	- <115g/L hemoglobin (Hb)
- >16% transferrin saturation	- <16% transferrin saturation	- <16% transferrin saturation

### Results

Lab assessment indicated that **97% of athletes had serum ferritin below 35 µg/L**, highlighting a high prevalence of iron deficiency.

Iron Status of the Women's Rowing Team



- Normal Iron (>35ug/L)
- Iron Depletion (20-34 ug/L)
- Moderate Iron Depletion (12-19 ug/L)
- Severe Iron Depletion (<12 ug/L)

### Interventions

The 36 athletes with iron deficiency were referred to the sports dietitian for further evaluation, treatment, and management.

Two interventions are recommended to address low serum ferritin: iron supplementation and dietary intervention.

#### 1. Iron Supplementation

- Athletes are provided with Nature Made elemental iron and instructions for supplementation.
- Supplement timing and methods for minimizing side effects are discussed.

Serum ferritin (µg/L)	>35	<35	<20
Elemental iron recommendation (mg/d)	0	25-65	65-100

#### 2. Dietary Intervention

- Athletes receive education on dietary strategies to improve or maintain iron status.
- Education on dietary sources of iron, bioavailability, and strategies to enhance absorption.

### Conclusions

Prevalence of iron deficiency in female rowing athletes was higher than previous estimates in the literature. This underlines the importance of routine screening and assessment of iron status in college athletes, particularly females, and the need for standardized protocols. Treatment plans should include both oral supplementation and dietary intervention.

References:  
1. DeliaVallio, D. M., & Haas, J. D. (2012). Iron status is associated with endurance performance and training in female rowers. *Medicine and science in sports and exercise*, 44(8), 1552-1559.  
2. Thomas, D. T., Erdman, K. A., & Burke, L. M. (2016). Position of the academy of nutrition and dietetics, dietitians of Canada, and the American college of sports medicine: Nutrition and athletic performance. *Journal of the Academy of Nutrition and Dietetics*, 116(3), 501-528.