



## **Professional Services:**

***Running Injury & Performance Services Assessment:*** This is a comprehensive functional and biomechanical evaluation and rehabilitation and consultation service for athletes with lower body (for example, foot, ankle, or knee) musculoskeletal injuries or who are looking to improve their running performance. Each runner will receive a personalized treatment plan, including structured physical therapy, specific stretching and strengthening exercises, and shoe/orthotic recommendations. Our expert professionals will work one-on-one with the athlete to develop an individualized program to help achieve his/her specific running goals.

***Sweat Fluid and Electrolyte Losses and Physiological Strain in the Heat Assessment:*** This is an individual evaluation of an athlete in a specific environment using a temperature, humidity level, and exercise intensity similar to where s/he has had performance or health problems (for example, premature fatigue, heat exhaustion, or muscle cramps) or to simulate upcoming training or competition conditions. Sweat fluid and electrolyte (sodium, potassium, and chloride) losses will be determined and cardiovascular and thermal strain (heart rate, core body temperature, and physiological strain index) will be measured. Individual-specific hydration and dietary strategies are provided for the athlete, so that s/he can more optimally prepare for, manage, and recover from sweat fluid and electrolyte losses incurred during training or competition.

***Fitness Testing ( $VO_{2max}$ ):***  $VO_{2max}$  (maximal aerobic capacity) reflects the strength of an athlete's cardio-respiratory system, including the ability of his/her muscles to use oxygen to meet the energy demands during exercise. A high aerobic capacity is especially important in endurance-type activities (for example, distance running, cycling, and swimming); however, it is also important to enhance recovery between brief intermittent bouts of high-intensity activity in other sports (such as soccer, tennis, basketball, and football) during practice and competition. This is a progressive incremental workload exercise test using a treadmill or bicycle, depending on the athlete's primary sport or preference.

***Fitness Testing (Anaerobic Threshold):*** Anaerobic threshold (AT), sometimes referred to as lactate threshold (LT), reflects the exercise intensity where the production of lactate in the exercising muscles increases sharply. AT is a very good predictor of sustained endurance capacity and performance and is also helpful in determining an athlete's appropriate training intensity zones. A high AT is especially important in endurance-type activities (distance running, cycling, and swimming). Tracking changes in AT can assist an athlete in assessing the effectiveness of his/her training over several months. This is a progressive incremental workload exercise test using a treadmill or bicycle depending on the athlete's primary sport or preference.

***Sport Nutrition Assessment and Consult:*** Sport-specific nutrition interventions can help an athlete maximize power and endurance, as well as overall performance and health. The intervention consists of a 3-day dietary analysis and a consult with a registered dietitian, including an assessment of daily eating patterns, training dietary habits, and nutrition tactics used during competition, including preparation and recovery. Through a one-on-one consultation with the dietitian, individualized strategies to maximize training and performance are developed. The dietitian also helps the athlete to work around any specific allergies or chronic health conditions. The goal is to help each athlete learn how to effectively fuel his/her body for optimal performance and health.

***Resting Energy Expenditure (REE) and Body Composition Evaluations:*** Determining your REE, or roughly the minimum number of calories your body needs each day to function properly without physical activity (at rest), is extremely important when trying to personalize your nutrition and fitness strategies. Body composition (relative percentage of body fat and lean body mass) and REE are closely linked to one another and provide a foundation for establishing your nutrition and fitness goals. Body fat percentage is estimated from multiple skinfold measurements and REE is determined from measuring oxygen and carbon dioxide exchange while lying down.

***Heat Tolerance Testing:*** This is an evaluation of an athlete's current tolerance to exercising in the heat, following a heat-related injury or a long period of no exposure to the heat. This test can also be used to evaluate an athlete's thermal and cardiovascular responses while wearing a particular clothing or uniform configuration during exercise.

***Athlete Field Evaluations:*** One or more athletes are evaluated during training, practice, or competition for hydration status (pre- and post-session), fluid intake, and sweat fluid and electrolyte (sodium, potassium, and chloride) losses. Individual-specific hydration and dietary strategies are provided for each athlete, so that each athlete can more optimally prepare for, manage, and recover from fluid and electrolyte losses incurred on the court or field. Thermal strain (core body temperature) can be monitored in selected individuals.

***Presentations and Discussions:*** The National Institute for Athletic Health & Performance will meet with coaching and support staff (for example, athletic trainers and administrators) and athletes to discuss sport-specific training and competition challenges and nutrition needs that will help the athletes to optimize training, performance, and recovery. There will be a particular emphasis on the challenges and solutions to training and competing safely and optimally in the heat while reducing the risk for heat- and fluid-electrolyte related problems (for example, muscle cramps, pre-mature fatigue, exhaustion, and hyponatremia).