# Sports Medicine

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Athletic training and sports-related injuries can involve multiple organ systems. Examples include exercise-induced asthma, idiopathic hypertrophic subaortic stenosis (hypertrophic cardiomyopathy), and fluid and electrolyte imbalance. In this issue of the *Rhode Island Medical Journal*, we present examples of sports-related pathology reflecting multiple organ involvement. **"The Female Athlete Triad"** describes the effects of exercise on both the endocrine system and bone density. Female athletes are susceptible to menstrual dysfunction and loss of bone density associated with negative energy balance. Originally thought to occur in women with eating disorders, it is now recognized to occur with normal caloric intake in the face of excessive caloric demands of exercise.

**"Exercise Induced Rhabdomyolysis"** describes the syndrome of skeletal muscle breakdown associated with strenuous exercise. The clinical presentation consists of disproportionate muscle pain after exercise associated with elevated creatine phosphokinase. The mechanism seems to be related to cell membrane damage with intracellular influx of calcium and efflux of cellular breakdown products. In extreme cases, myoglobinuria and acute renal failure result.

Osteoarthritis (OA) following joint injuries in athletics (post-traumatic OA) is now recognized as a whole joint disease involving multiple tissues – cartilage, bone, ligament, capsule, and possibly having contributions from bone vasculature and inflammatory pathways. Anterior cruciate ligament tears are common causes of post-traumatic OA but most certainly involves trauma to other tissues in the joint that may be unrecognized at the time of injury.

**"Post-traumatic Osteoarthritis after ACL Injury"** discusses the contributions of bone and cartilage to joint damage and describes the mechanics of injury in pre-clinical models. Epidemiological and clinical research initiatives that may result in treatment programs are described.

Contemporary knee ligament reconstructions are assisted by intraoperative computer guidance for optimal graft placement and tension. **"Predicting Success in ACL Reconstruction"** describes the challenges of individualizing reconstructions and optimizing knee stability. The role of state-of-the-art computer navigation for the assessment and correction of the ACL injury is described along with the functional outcomes and return to sports of ACL-injured athletes.

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