SPORTS MEDICINE: Diabetic Student-Athlete Guidelines

Goal:

Embry-Riddle Aeronautical University will act in accordance with the position statement published by the National Athletic Trainers' Association (NATA) in 2007. The goal we hope to achieve in the treatment of Type I Diabetes is to maintain blood-glucose levels within a normal range (100-180mg/dL) without inducing an unnecessary hypoglycemic event.

There are two types of Diabetes, Type I (insulin dependent) or Type II (non-insulin dependent). Type I diabetes is characterized by decreased insulin production and it is prevalent among children and young adults. Its onset is often sudden and may follow an acute viral flu illness. Most collegiate athletes with diabetes will present as Type I diabetics. Type II diabetes is characterized by the body's inability to utilize insulin, leading to insulin resistance. Its onset and symptoms are gradual. Potential risk factors associated with Type II diabetes include age, obesity, minority ethnicity, and family history.

Prevention:

Prior to beginning their athletic careers at Embry-Riddle Aeronautical University, each student-athlete will fill out a thorough medical history questionnaire and physical to be reviewed by the team physicians.

- If a student-athlete exhibits signs or symptoms of diabetes, he/she will be required to follow the instructions of the team physician and/or team athletic trainer.
- Upon successful completion of the pre-participation physical, each student-athlete diagnosed with Type I diabetes will have a plan of care devised for practice, home, and away competitions. This plan of care will have input from the team physician, the team athletic trainer and the sports dietician.
    - Additional testing may be deemed necessary, as well as practice limitations and possible nutritional restrictions.
- If a student-athlete has previously been diagnosed with Type I diabetes, they are required to gather and submit all relevant previous medical records for the team physician and athletic trainer to review. At this time, the team physician and athletic trainer will work with the student-athlete to develop a plan of care.
- Returning student-athletes who have previously been diagnosed with Type I diabetes will be red-flagged and will come in for pre-season physicals to update the physician and athletic trainer on any changes to their plan of care.
- If a student-athlete is suspected to be at risk for Type II diabetes, they will be seen by the team physician and referred to the team nutritionist for further counseling and support.

Diabetic Plan of Care

The plan will encompass but not limited to the following:

- Glucose monitoring guidelines and recommendations
    - Maintain near-normal blood glucose levels (100 to 180mg/dL)
- Insulin therapy guidelines
    - Type of Insulin used
    - Dosages
    - Adjustment strategies for activities in sport (lifting, conditioning, practice, game)
    - Insulin correction dosage for high blood glucose levels
- Limitations/Restrictions
- List of other medications including those used to assist with glycemic control and/or other diabetes-related conditions
- Guidelines of hyper-/hypo- glycemic events. Include instructions on use of glucagon and treatment of hyperglycemia and ketosis.
- Emergency contact information
- It is recommended that a medical alert tag be worn at all times

At the beginning of each academic year, each student-athlete diagnosed with Type I diabetes will meet with their assigned athletic trainer, the team physician and the head coach to review the plan of care. The student-athlete must have access to supplies for managing glycemic emergencies at all times. The student-athlete or parent/guardian must provide the necessary supplies and equipment. When the student-athlete requires assistance, the athletic trainer and/or other members of the diabetic management team (eg, coach) must have immediate access to these supplies.

Supplies for Student-Athlete Kit

The student-athlete is responsible for providing his/her athletic trainer all the necessary supplies to treat a diabetic emergency. The supplies are to be present at each practice and competition. The supplies should include all, but are not limited to the following:

- Plan of care
- Blood monitoring equipment and supplies (glucose meter, testing strips and insulin)
- Supplies to treat hypoglycemia (i.e. orange juice, non-diet soda, glucose tablets, etc.)
- Sharps container to discard lancelets or syringes adequately
- Extra batteries for glucose meter or insulin pump

Recognition, Treatment, and Prevention of Glycemic Events

The team athletic trainer or coach responsible for the care of the student-athlete with Type I diabetes shall be aware and have the responsibility and ability to prevent, recognize and treat episodes of hyperglycemia and hypoglycemia. If exercise or any other activity is seen to elevate the risk or frequency of hyperglycemic events it is recommended that the student-athlete follow-up with the team physician.

Athletic Injury and Glycemic Control

- Athletic injuries are an inherent risk to sport. The body responds to such injuries by secreting stress hormones to aid in the healing process. Some of these hormones are the culprits of hyperglycemic states. For student-athletes with Type I diabetes, this can actually hinder the healing process because their hyperglycemic response is an exaggerated one. Diabetic student-athletes should strive to maintain normal glucose levels by constant monitoring and adequate insulin administration. When a student-athlete with Type I diabetes suffers an injury, he/she and the team athletic trainer should refer back to the plan of care for appropriate glucose level monitoring.

Hypoglycemia

- Factors contributing to hypoglycemia are, exercise, over-insulinization, previous hypoglycemic incident in preceding 24-72 hours.
- Prevention of hypoglycemia include blood glucose monitoring, carbohydrate supplementation, and insulin adjustments.
- Signs and Symptoms: tachycardia, sweating, palpitations, hunger, nervousness, headache, trembling, dizziness, loss of consciousness, and death; symptoms can occur 12-24 hours after exercise
- Treatment: if glucose levels below 100 mg/dL, ingest carbohydrates prior to exercise

  Mild – athlete conscious and able to swallow/follow directions, administer 10-15g carbohydrates (approx. 4-8 glucose tablets, sugary candy low in protein, regular soda [not diet], 2tbsp of honey), reassess glucose levels immediately and 15 minutes later, if no response when retesting blood glucose, re-administer carbohydrate tablet, if still no response following 2nd dose activate EMS. If at any time symptoms continue to deteriorate, activate EMS.

  Severe – unconscious or unable to swallow/follow directions, activate EMS and administer Glucagon. Glucagon should be provided by student-athlete at beginning of year and stored in the athletic training room refrigerator, instructions located inside injection kit. Shake vial of powder, inject liquid from syringe into vial, swirl to mix solution, inject into alcohol swabbed arm, buttocks, or thigh
- Return to Exercise: If they respond properly and symptoms resolve, may return to activity. Prudent to have student-athlete ingest a low-glycemic-index carbohydrate such as bagel or bread to prevent recurrence of hypoglycemia. If referred to a physician, follow physician's return to play guidelines.

Hyperglycemia

- Factors contributing to hyperglycemia are high intensity exercise >85% maximal heart rate, psychological stress of competition, and training in a hot/humid environment. Prevention of hyperglycemia include: blood glucose monitoring, insulin adjustments, and urine testing for ketone bodies.
- Signs & Symptoms: with or without ketosis, nausea, dehydration, reduced cognitive performance, feelings of sluggishness, fatigue
  - **Ketosis**: very high blood sugar level (above 300 mg/dL) coupled with a severe shortage of insulin in the body, symptoms include unusual fatigue, sleepiness, loss of appetite, increased thirst, frequent urination, rapid/deep/sighing breathing, and sometimes a fruity odor on their breath. This can lead to coma or death and should be treated by medical personnel immediately.
  - **Ketoacidosis**: blood glucose > 240 mg/dL
- Treatment: avoid exercise if levels above 250 mg/dL, immediate physician referral if levels > 300mg/dL
- Return to Exercise: If they respond properly and symptoms resolve, may return to activity. If referred to a physician, follow physician's return to play guidelines.

Reference "National Athletic Trainers' Association Position Statement: Management of the Athlete with Type 1 Diabetes Mellitus"
https://www.nata.org/sites/default/files/mgmtofathletewithtype1diabetesmellitus.pdf