

## **Relative Energy Deficit (Female Triad)**

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*Category: High School*

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### **ABSTRACT**

**CLINICAL PRESENTATION & EXAM:** The relative energy deficit also known as RED-S or the Female Triad, is a common occurrence with females. RED-S occurs due to many factors such as increased energy output, decreased energy intake, or can sometimes be caused by both. RED-S in females is diagnosed by three symptoms: abnormal eating habits, osteoporosis, and functional hypothalamic amenorrhea. The patient does not need to experience all three symptoms to be diagnosed with RED-S. The energy deficit affects physiological functions such as cardiovascular health, immunity, protein synthesis, along with menstrual functions in females. **ANATOMY & PATHOLOGY:** Osteoporosis is a condition in which the bone becomes weak due to low bone production. Functional hypothalamic amenorrhea is a reversible disorder in which the pulsatile release of gonadotropin-releasing hormone from the hypothalamus is impaired. Gonadotropin-releasing hormone is a hypothalamic decapeptide that helps to maintain reproductive functions. The hypothalamus is a region in the lower-part of the brain that plays a major role in helping to release hormones. **DIAGNOSTIC TESTING & CONSIDERATIONS:** Some common signs that an athlete might have RED-S are irritability, gradual weight loss, or irregular menses. When testing for RED-S, there is not a single test to diagnose it. A patient may take multiple diagnostics tests such as a pregnancy test, MRI, pelvic ultrasonography, endometrial biopsy, electrocardiography, radiography, and many other tests. Along with these tests, it is recommended to test for the individual symptoms of RED-S. Testing for the amount of energy a patient has is vital. Testing options include but are not limited to, a thorough physical exam, assessments of energy intake and output and an examination of the patient's body mass index. It is important to remember that body mass index is not always accurate due to the unrepresented energy level of a patient. When testing for functional hypothalamic amenorrhea, a patient must undergo a series of tests to evaluate if they are pregnant, have a tract obstruction, or are experiencing primary ovarian insufficiency. The use of tests such as a pregnancy test, serum luteinizing hormone test, a pelvic ultrasound, are recommended for diagnosing functional hypothalamic amenorrhea. Screening yearly for this syndrome is recommended. **TREATMENT & RETURN TO ACTIVITY:** In order to treat RED-S, a patient usually needs to consult with a group of medical professionals. A patient must undergo a physical examination to find out which parts of the body have been affected. Treatment options should be equipped to fit each symptom of the energy deficit and the patient. It is recommended to try treating the syndrome without the use of pharmaceutical drugs by maintaining sufficient energy, calorie, and calcium intakes. Treating balanced energy levels in a patient who restricts their energy intake requires an examination by a mental health professional. If a patient did not intentionally limit their energy intakes, then she would be referred to a dietician to help manage her energy levels and/or have restrictions placed on her activities. Any patient with hormone deficiency is recommended to use pharmaceutical treatments. In order to recover bone loss and prevent it, the physician must help the female patient recover her normal menses. The recovery of menses is vital. If left untreated, the patient could continue to lose bone mass. Healthy weight gain in a patient has also been proven to help recover bone mass. The athletic trainer of an athlete is well equipped to help provide a treatment option for an athlete and tailor her recovery exercises.