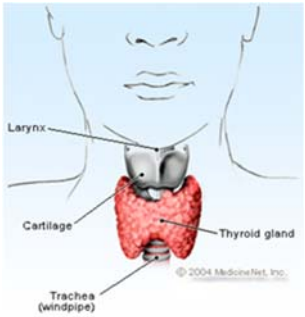
# Building Blocks of Clinical Practice

*Helping Athletic Trainers Build a Strong Foundation*

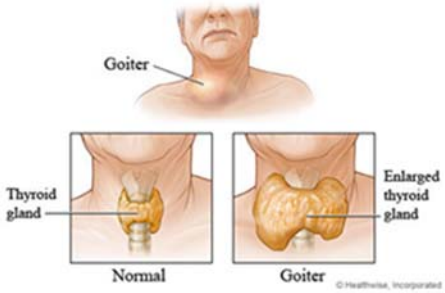
## Issue #12:
## Hyperthyroidism

- a disease that increases thyroid hormone secretion
- the thyroid is a butterfly-shaped gland located in the anterior neck, between the clavicle and Adams apple
- more common in women (5:1 ratio)
- main characteristic is an increased basal metabolic rate
- diagnosed from clinical evaluation and laboratory tests
- laboratory test, for college aged athletes, include elevated Thyroxine (T4) and Triiodothyronine (T3) and depressed TSH when compared to normal values




**Causes:**

- can be caused by autoimmune disorders, acute inflammation, or supplement abuse
- Graves' disease, the most common cause[4], is an autoimmune disorder that stimulates thyroid gland growth and hormone synthesis/release.[5] Ophthalmopathy is characteristic of this specific disease. "Hasitoxicosis" initially presents similar to Graves' disease but is followed by thyroid gland destruction from lymphocytes.[7]
- Thyroiditis is when acute inflammation causes transient hyperthyroidism. This is followed by a hypothyroid phase, and will usually recover to normal function.[7]
- Exogenous hyperthyroidism is when the source of increased thyroid hormone originates from outside the gland[7]. These sources include: medications (Levothyroxine), thyroid extract (desiccated thyroid from animal sources), and mixtures of synthetic T3 and T4 (liotrix, thyrolar). Dangerously, acute thyroid hormone abuse may lead to myocardial infarction, hyperthyroidism, and seizures in young athletes.[9]




**Signs and symptoms:**

- unusual fatigue and decrease in performance/exercise tolerance
- undesired weight loss
- elevated resting heart rate
- atrial fibrillations [10]
- presence of a goiter, or enlarged thyroid gland [10]
- Protopsis (i.e. bulging eyes), due to inflammation of extraocular muscles and orbital fat and connective tissue

Protopsis

- Lid Lag is when the eye lid doesn't move as it should—positive finding is when you see the sclera above the iris when they follow your finger down.[11]
- increased diaphoresis, urinary frequency and/or hyperdefecation [10]
- insomnia, anxiety, tremulousness, emotional lability, rapid speech [10]


Lid Lag

**Treatment:**

- treatments include oral medications (antithyroid agents) or removal/ablation of the thyroid gland
- B-blockers have been use to treat symptoms (diaphoresis, irritability), however are not recommended for athletes because of its effect on exercise endurance[11]
- calcium and vitamin D supplementation may be appropriate to counteract the effect on bone tissue

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**Management:**

- currently, there is no evidence to support pre-participation or routine thyroid screening[9]
- early diagnosis and treatment is essential
- data presented at the 2008 Annual Meeting of the American Thyroid Association, patients with subclinical hyperthyroidism, are at increased risk of all-cause death
- uncontrolled hyperthyroidism may stimulate arrhythmias, elevated blood pressure, and decreased bone health
- heat illness and rhabdomyolysis become concerns since an increased metabolic rate raises temperature and depletes muscle energy stores[9]
- Although there are no return to play guidelines for athletes established,[9] it seems prudent to remove the athlete from participation until thyroid hormone levels and symptoms normalize. Once the athlete's hormone levels and symptoms normalize, a gradual progression of exercise frequency and intensity should begin.[9] Additional monitoring should be considered if competitive levels change (i.e. off-season to in-season) or if performance reduces.[9] Daily tracking may be beneficial to the clinician and athlete to monitor progress.

### Hyperthyroidism Symptom Checklist

*The purpose of this checklist is to track thyroid conditions to see a progression or regression in the patients condition

*Nutrition is also very important. Since metabolism is hyperactive, 50-60% of Caloric intake needs to be from carbohydrates

| *Activities of Daily Living* | Date: | Date: | Date: | Date: | Date: | Date: |
|---|---|---|---|---|---|---|
| Sleep | | | | | | |
| # Hrs Sleep | | | | | | |
| Quality of Sleep (subjective 1-10 scale, 10 is best) | | | | | | |
| How rested did you feel when you woke up? (subjective 1-10 scale, 10 is best) | | | | | | |
| Urination | | | | | | |
| # times during sleeping hours (>1x/night is abnormal) | | | | | | |
| Heart Rate | | | | | | |
| Basal Metabolic Heart Rate (>75 BPM for young adult is abnormal) | | | | | | |
| Body Weight | | | | | | |
| Lbs (Check once per week) | | | | | | |

| *During Exercise* | | | | | | |
|---|---|---|---|---|---|---|
| Heart Rate During Warm Up (after jogging 2 lengths of the field - should not be above 130 for a healthy and fit 20y/o. More than jogging should be incorporated in this warm up) | | | | | | |
| HR - 10 minutes | | | | | | |
| RPE 10 minutes | | | | | | |
| HR - 20 minutes | | | | | | |
| RPE - 20 minutes | | | | | | |
| HR - 30 minutes | | | | | | |
| RPE - 30 minutes | | | | | | |

*consider that the athlete is in a constant state of fatigue, which increases orthopedic injury risk

**References**


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