

BM5063 Systems Medicine

Problem Set 4

Instructions

1. You are not expected to submit answers to these problems

Questions

1. Write Python program to study HPA axis. Using this program study the effect of chronic stress and steroid withdrawal.
2. Modify the HPA axis Python program to study iodine deficiency.
3. Graves' disease is an autoimmune disease that causes hyperthyroidism in about 1% of the population, usually around middle age. In Graves' disease, the body produces antibodies that activate the TSH receptor, mimicking TSH. As a result, the thyroid produces more thyroid hormones. Modify the HPT axis equations to model Graves' disease.
4. In India, doctors usually prescribe Thyrox or Thyronorm for an underactive thyroid gland (hypothyroidism). Using the Python program study the effect of dosage of these drugs on the HPT axis function. How do these lower TSH levels?

