

## Exercise Effect on Sex Hormones

- Hormones are natural substances produced in the body.
- They help to relay messages between cells and organs and affect many bodily functions.
- Everyone has what are considered “male” and “female” sex hormones.
- The female sex hormones fluctuate throughout life.
- The two main female sex hormones are estrogen and progesterone.
- Although testosterone is considered a male hormone, females also produce and need a small amount of this, too.

### The Hormones in a Woman:

#### A. Irisin:

- Irisin is referred to as the exercise hormone, which basically makes it a biological workout buddy.

#### Function:

- ❖ It battles fat on two fronts: First, by activating genes that turn bad white fat into good brown fat and secondly, by regulating undifferentiated stem cells to become bone-building cells instead of fat storage.
- ❖ It may also protect brain cells from injury and aging.

#### Exercise affect on Irisin:

- ❖ Getting sweaty stimulates body’s Irisin production.
- ❖ Single sessions of both moderate intensity exercise and HIIT raises levels of the hormone by 12 percent among obese women and single session of both intense endurance exercise and strength training increased Irisin.
- ❖ All the more reason women should hit the heavy weights.
- ❖ One of the best ways to turn on Irisin is to perform intermittent fasting for 18 hours and follow it with moderate exercise or HIIT training.

#### B. Estrogen:

- Estrogen is the major female hormone.
- The lion’s share comes from the ovaries, but small amounts are produced in the adrenal glands and fat cells.
- During pregnancy, the placenta also makes estrogen.
- Estrogen plays a big role in reproductive and sexual development, including:
  - puberty
  - menstruation
  - pregnancy
  - menopause
- Estrogen also affects the:
  - Brain
  - Cardiovascular system
  - Hair

- Musculoskeletal system
- Skin
- Urinary tract
- Estrogen levels can be determined by a blood test.
- While it can vary from person to person, these are what's considered the normal ranges in picograms per milliliter (pg/mL):

**Adult female, premenopausal:** 15-350 pg/mL

**Adult female, postmenopausal:** <10 pg/mL

**Adult male:** 10-40 pg/mL

- Levels will vary greatly throughout the menstrual cycle.
- Too much of Estrogen is a major risk factor for breast cancer.
- Many have excess estrogen circulating for several reasons related to modern life—everything from pesticides to the pill. Most women, starting around age 35, develop “Estrogen Dominance”.

Functions: plays a major role in:

- ❖ The development of physical features like breasts, the menstrual cycle, and reproduction.
- ❖ It also affects bone health, cholesterol making it the master multi-tasker of endocrine system.

Exercise affect on Estrogen:

- ❖ Exercise helps to reverse the trend of Estrogen Dominance, leading to lower risk of breast cancer for premenopausal and postmenopausal women alike.
- ❖ In fact, not only does exercise reduce breast cancer risk, it also reduces mortality after diagnosis and among survivors.

### C. Progesterone:

- The ovaries produce the female sex hormone progesterone after ovulation.
- During pregnancy, the placenta also produces some.
- The role of progesterone is to:
  - Prepare the lining of the uterus for a fertilized egg
  - Support pregnancy
  - Suppress estrogen production after ovulation
  - The normal range of Progesterone (Nanogram) is as followed:

Phase	Range

Before puberty	0.1–0.3 ng/mL
During first (follicular) stage of menstrual cycle	0.1–0.7 ng/mL
While ovulating (luteal stage of cycle)	2–25 ng/mL
First trimester of pregnancy	10–44 ng/mL
Second trimester	19.5–82.5 ng/mL
Third trimester	65–290 ng/mL

- Progesterone levels can be determined by a blood test.

#### D. Testosterone:

- Small amounts of testosterone come from the adrenal glands and ovaries.
- This hormone plays a role in several body functions, including:
  - Sexual desire
  - Regulation of the menstrual cycle
  - Bone and muscle strength
- A blood test can determine your testosterone level.
- The normal range for females is 15 to 70 nanograms per deciliter (ng/dL).

Functions: Testosterone is the male sex hormone, but it's produced in women's bodies, too (just in smaller amounts). It plays a major role in

- ❖ Helping to grow muscle
- ❖ Repairing muscle proteins damaged by exercise.

#### Exercise affect on Testosterone:

- ❖ Stimulates production of testosterone
- ❖ Boost sex drive
- ❖ Increase muscle mass
- ❖ Reduce excess belly fat

#### E. Human Growth Hormone (HGH):

Function: HGH plays many roles in body's basic functions:

- ❖ Contributing to muscle and bone strength
- ❖ Ability to regulate fat metabolism.

#### Exercise affect on GHG:

- ❖ Specifically high-intensity workouts that involve serious resistance (i.e. heavy weights) and explosive movement (the type that leaves breathless quickly), as opposed to endurance exercise, stimulate major production increase.

#### **F. Cortisol/Stress Hormone:**

##### Functions:

- ❖ It's essentially in charge of regulating changes in the body that happen in response to anxiety and tension.
- ❖ Those feeling the pressures of modern life generally have excess cortisol circulating, which increases abdominal fat.

##### Exercise affects on Cortisol:

- ❖ Low-intensity exercises decrease cortisol levels (or, at the very least, not affect them at all).
- ❖ While moderate to high-intensity exercise may increase cortisol. That increase is generally seen as acute as opposed to chronic.
- ❖ The one kind of exercise that does lead to chronic cortisol increase is intense endurance training.
- ❖ For everyone else, "aim for targeted, smart overload followed by adequate and active rest.

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