Adolescence and puberty: The period of transition of physical and mental human development from childhood to adulthood is called adolescence. An adolescent is neither a child not an adult. Puberty is the start of the time when a boy is biologically ready to become a father and a girl is biologically ready to become a mother. The average onset of puberty is at 10 years of age for girls and 12 years for boys.

Change at puberty: During puberty the following changes occur.

1. Increase in height: the most dramatic and visible change is the sudden increase in height and weight at the onset of the puberty period. There are changes that occur in the body proportions. The arms and legs grow faster than the rest of the body.

2. Change in the size of heart and lungs: the diameter of the heart increases by half and the weight almost doubles itself. There is an increase in size and capacity of lungs too.

3. Change in body shape: boys generally have larger bones, more muscles, larger heart and lungs as compared to girls. Boys also have broad shoulders and narrow hips while the girls have curvaceous body and broader hips due to the enlargement of pelvic bones.

4. Change in voice: larynx also known as the voice box is present in the throat. It is a tube- shaped piece of cartilage. The larynx is what gives you your pitch of voice. When the larynx grows larger during puberty, it protrudes out in front of the throat. This is called and Adam's apple. Larynx grows more in boys than girls. That is why, boys show Adam's apple in front of the neck.

5. Increase activity of sweat glands: the sweat glands of the body develop fully during puberty and there is an increased secretion of sweat. Acne and pimples are common among adolescents.

Endocrine system: The endocrine system consists of a collection of bag-like structures called glands. These glands are located at specific places inside our bodies and release chemical substances called hormones. The major glands that make up the human endocrine system are pituitary, thyroid, adrenals, pancreas, ovaries, and testes. A diagrammatic representation of the human endocrine system is shown.

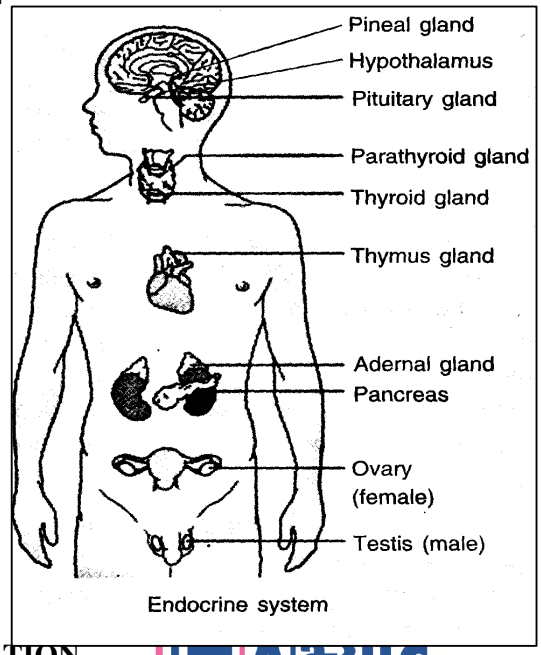
1. Pituitary gland
Location: base of the brain
Hormones secreted:
Thyroid stimulating hormone (TSH)
Growth hormone (GH)

2. Thyroid gland
Location: base of the throat
Hormones secreted: Thyroxine

3. Adrenal gland
Location: near the kidneys
Hormones secreted: Adrenaline

4. Pancreas
Location: near the liver
Hormones secreted: insulin

5. Testes:



Endocrine system

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(In males; two in number)
Location: male genital organs
Hormones secreted:
Testosterone
6. **Ovaries** (in female; two in number)
Location: pelvic region
Hormones secreted:
Osestrogen

Role of Hormones in Completing the Life Cycle of Insects and Frogs:

Metamorphosis is a biological process by which an animal physically develops after birth or hatching, involving an abrupt change in the animal's body structure through cell growth and differentiation. Growth and metamorphosis in insects are controlled by hormones synthesized by endocrine glands. Some cells of the brain of insects secrete a hormone that activates another gland, which secretes a second hormone that induces metamorphosis.

A hormone released by the thyroid gland is a signal for metamorphosis in many amphibians like frogs. This hormone requires the presence of iodine in water for its production. If the water in which tadpoles are growing is deficient in iodine, the tadpoles fail to grow and cannot become adult frogs.

Hormones and their role in the body:

Hormone	Role in the body
Thyroid stimulating hormone (TSH) growth hormone (GH)	TSH stimulates the growth and functions of the thyroid gland, GH stimulates the growth and development of the body
Insulin	It regulates the blood sugar level. Inability of the body to produce insulin in sufficient quantity may result in a disease called diabetes.
Thyroxine	It regulates body temperature and plays an important role in growth and development. Inhability of the body produce this hormone may result in a disease called goiter, which causes swelling of the neck.
Adrenaline	It helps in the defence of the body in emergency situations.
Oestrogen	It controls the development of secondary sexual characteristics, like development of breasts, in females.
Testosterone	It controls the development of secondary sexual characteristics, like facial hair, in males.