IMPORTANT ENDOCRINE ORGANS AND HORMONES pdf

1: A Patient Guide to the Endocrine System: Hormones, Glands & More

Several organs play a major role in helping the endocrine system to work well. Although these organs are not glands themselves, they do produce, store, and send out hormones that help the body to function properly and maintain a healthy balance.

It links the endocrine system and nervous system. Nerve cells in the hypothalamus make chemicals that control the release of hormones secreted from the pituitary gland. The hypothalamus gathers information sensed by the brain such as the surrounding temperature, light exposure, and feelings and sends it to the pituitary. This information influences the hormones that the pituitary makes and releases. Despite its small size, the pituitary is often called the "master gland. The pituitary gland makes many hormones, such as: The pituitary also secretes hormones that signal the reproductive organs to make sex hormones. The pituitary gland also controls and the menstrual cycle in women. THY-royd is in the front part of the lower neck. It makes the thyroid hormones thyroxine pronounced: These hormones control the rate at which cells burn fuels from food to make energy. The more thyroid hormone there is in the bloodstream, the faster chemical reactions happen in the body. Attached to the thyroid are four tiny glands that work together called the parathyroids pronounced: They release parathyroid hormone, which controls the level of calcium in the blood with the help of calcitonin pronounced: These two triangular adrenal pronounced: The adrenal glands have two parts, each of which makes a set of hormones and has a different function: The outer part is the adrenal cortex. It makes hormones called corticosteroids pronounced: The inner part is the adrenal medulla pronounced: It makes catecholamines pronounced: Also called adrenaline, epinephrine increases blood pressure and heart rate when the body is under stress. It secretes melatonin pronounced: The gonads are the main source of sex hormones. In guys the male gonads , or testes pronounced: TES-teez , are in the scrotum. They secrete hormones called androgens pronounced: AN-druh-junz , the most important of which is pronounced: OH-vuh-reez , are in her pelvis. They make eggs and secrete the female hormones pronounced: Estrogen is involved when a girl starts puberty. During puberty, a girl will have breast growth, start to accumulate body fat around the hips and thighs, and have a growth spurt. These hormones also play a role in pregnancy. PAN-kree-us makes insulin pronounced: IN-suh-lin and glucagon pronounced: GLOO-kuh-gawn , which are hormones that control the level of glucose , or sugar, in the blood. Insulin helps keep the body supplied with stores of energy. The body uses this stored energy for exercise and activity, and it also helps organs work as they should. To help keep your endocrine system healthy: Get plenty of exercise. Go for regular medical checkups. Talk to the doctor before taking any supplements or herbal treatments. Let the doctor know about any family history of endocrine problems, such as diabetes or thyroid problems. When Should I Call the Doctor? Let the doctor know if you:

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2: About the Endocrine System - Endocrine Glands and Hormones

The endocrine system completes these tasks through its network of glands, which are small but highly important organs that produce, store, and secrete hormones.

Pituitary gland The pituitary gland hangs from the base of the brain by a stalk and is enclosed by bone. It consists of a hormone-producing glandular portion anterior pituitary and a neural portion posterior pituitary , which is an extension of the hypothalamus. The hypothalamus regulates the hormonal output of the anterior pituitary and creates two hormones that it exports to the posterior pituitary for storage and later release. Four of the six anterior pituitary hormones are tropic hormones that regulate the function of other endocrine organs. Most anterior pituitary hormones exhibit a diurnal rhythm of release, which is subject to modification by stimuli influencing the hypothalamus. Somatotropic hormone or Growth hormone GH is an anabolic hormone that stimulates growth of all body tissues but especially skeletal muscle and bone. It may act directly, or indirectly via insulin-like growth factors IGFs. GH mobilizes fats, stimulates protein synthesis, and inhibits glucose uptake and metabolism. Hypersecretion causes gigantism in children and acromegaly in adults; hyposecretion in children causes pituitary dwarfism. Thyroid-stimulating hormone TSH promotes normal development and activity of the thyroid gland. Thyrotropin-releasing hormone TRH stimulates its release; negative feedback of thyroid hormone inhibits it. Adrenocorticotropic hormone ACTH stimulates the adrenal cortex to release corticosteroids. The gonadotropins â€" follicle-stimulating hormone FSH and luteinizing hormone LH regulate the functions of the gonads in both sexes. FSH stimulates sex cell production; LH stimulates gonadal hormone production. Gonadotropin levels rise in response to gonadotropin-releasing hormone GnRH. Negative feedback of gonadal hormones inhibits gonadotropin release. Prolactin PRL promotes milk production in human females. The neurohypophysis stores and releases two hypothalamic hormones: Oxytocin stimulates powerful uterine contractions, which trigger labor and delivery of an infant, and milk ejection in nursing women. Its release is mediated reflexively by the hypothalamus and represents a positive feedback mechanism. Antidiuretic hormone ADH stimulates the kidney tubules to reabsorb and conserve water, resulting in small volumes of highly concentrated urine and decreased plasma osmolarity. ADH is released in response to high solute concentrations in the blood and inhibited by low solute concentrations in the blood. Hyposecretion results in diabetes insipidus. Thyroid The thyroid gland is located at the front of the neck, in front of the thyroid cartilage , and is shaped like a butterfly, with two wings connected by a central isthmus. Thyroid tissue consists of follicles with stored protein called colloid, containing thyroglobulin , a precursor to other thyroid hormones, which are manufactured within the colloid. The thyroid hormones increase the rate of cellular metabolism , and include thyroxine T4 and triiodothyronine T3. Secretion is stimulated by the hormone TSH, secreted by the anterior pituitary. When thyroid levels are high, there is negative feedback that decreases the amount of TSH secreted. Most T4 is converted to T3 a more active form in the target tissues. Calcitonin , produced by the parafollicular cells of the thyroid gland in response to rising blood calcium levels, depresses blood calcium levels by inhibiting bone matrix resorption and enhancing calcium deposit in bone. Parathyroid gland The parathyroid glands, of which there are , are found on the back of the thyroid glands, and secrete parathyroid hormone PTH , [1] which causes an increase in blood calcium levels by targeting bone, the intestine, and the kidneys. PTH is the antagonist of calcitonin. PTH release is triggered by falling blood calcium levels and is inhibited by rising blood calcium levels. Adrenal gland The adrenal glands are located above the kidneys in humans and in front of the kidneys in other animals. The adrenal glands produce a variety of hormones including adrenaline and the steroids aldosterone and cortisol. It stimulates the heart and its conducting tissues and metabolic processes. Pancreas The pancreas, located in the abdomen, below and behind the stomach, is both an exocrine and an endocrine gland. The alpha and beta cells are the endocrine cells in the pancreatic islets that release insulin and glucagon and smaller amounts of other hormones into the blood. Insulin and glucagon influence blood sugar levels. Glucagon is released when blood glucose level is low, and stimulates the liver to release glucose into the blood. Insulin increases the rate of glucose uptake and metabolism by most body cells. Gonad The ovaries of the female,

located in the pelvic cavity, release two main hormones. Secretion of estrogens by the ovarian follicles begins at puberty under the influence of FSH. Estrogens stimulate maturation of the female reproductive system and development of the secondary sexual characteristics. Progesterone is released in response to high blood levels of LH. It works with estrogens in establishing the menstrual cycle. The testes of the male begin to produce testosterone at puberty in response to LH. Testosterone promotes maturation of the male reproductive organs, development of secondary sex characteristics, and production of sperm by the testes. Pineal gland The pineal gland is located in the diencephalon of the brain. It primarily releases melatonin , which influences daily rhythms and may have an antigonadotropic effect in humans.

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3: Endocrine System Organs, Glands | Hormones and Metabolism

The hormones are released into the bloodstream and may affect one or several organs throughout the body. Hormones are chemical messengers created by the body. They transfer information from one set of cells to another to coordinate the functions of different parts of the body. The major glands of the endocrine system are the hypothalamus, pituitary, thyroid, parathyroids, adrenals, pineal body, and the reproductive organs (ovaries and testes).

By Editors Endocrine System Definition The endocrine system is a collection of ductless glands that produce hormones and secrete them into the circulatory system , without the intermediate presence of ducts carrying secretions towards target organs. Hormones can therefore act as chemical messengers for a large number of cells and tissues simultaneously, even if the target cells are distant from their tissue of origin. They can also regulate nearly every metabolic activity of the body and produce an integrated response. Endocrine glands are usually heavily vascularized, containing a dense network of blood vessels. Cells within these organs often contain hormones in intracellular granules or vesicles that fuse with the plasma membrane in response to the appropriate signal, releasing the hormones into the extracellular space. The endocrine system, along with the nervous system, integrates the signals from different parts of the body and the environment. In addition, the endocrine system produces effector molecules in the form of hormones that can elicit an appropriate response from the body in order to maintain homeostasis. While the nervous system produces immediate effects, the endocrine system is designed to be relatively slow in initiation but with a prolonged effect. As an example, the long-term secretion of growth hormone in the body influences the development of bones and muscles to increase height, and also induces the concomitant increase in size of every internal organ. This happens over the course of many years. Hormones like cortisol, produced during times of stress, can change appetite, and metabolic pathways in skeletal and smooth muscle for hours or weeks. Functions of the Endocrine System The endocrine system is involved in every process of the human body. Starting from the motility of the digestive tract, to the absorption and metabolism of glucose and other minerals, hormones can affect a variety of organs in different ways. Some hormones affect the retention of calcium in bones or their usage to power muscle contraction. In addition, they are involved in the development and maturation of the adaptive immune system, and the reproductive system. Crucially, they can affect overall growth and metabolism, changing the way every cell assimilates and utilizes key nutrients. Organs of the Endocrine System The endocrine system consists of a number of organs â€” some of which have hormone production as their primary function, while other play important roles in other organ systems as well. These include the pituitary and pineal glands in the brain, the thyroid and parathyroid glands in the neck, the thymus in the thoracic region, the adrenals and pancreas in the abdominal region and the gonads in the reproductive system. Endocrine System Diagram Starting from the brain, the hypothalamus, pituitary and pineal glands are involved in the regulation of other endocrine organs and in the regulation of circadian rhythms, changing the metabolic state of the body. The pineal gland is located near the center of the brain, in a region called the epithalamus. The pituitary gland is seen very near the hypothalamus and has some direct interactions and feedback loops with the organ for the production of hormones. Together, the hypothalamus and pituitary can regulate a number of endocrine organs, particularly the gonads, and the adrenals. In fact, the hypothalamus can be considered as the nodal point that integrates two major pathways for regulation â€” the nervous and endocrine systems. It is made of a collection of neurons that collect information from the body through the nervous system and integrate it into a response through the endocrine system, especially the anterior and posterior parts of the pituitary gland. The neck contains the thyroid and parathyroid glands. The thyroid gland consists of two symmetric lobes connected by a narrow strip of tissue called the isthmus glandularis, forming a butterfly-like structure. Each lobe is about 5cm in height, and the isthmus is approximately 1. The gland is situated in the front of the neck, behind the thyroid cartilage. Each lobe of the thyroid gland is usually positioned in front of a pair of parathyroid glands. Each of the four parathyroid glands is approximately 6x3x1 mm in size, and weighs between 30 and 35 gms. There can be some variation in the number of parathyroid glands among individuals, with some people having more than 2 pairs of glands. The thymus is an endocrine organ situated behind the sternum also known as the breastbone

, between the two lungs. It is pinkish-gray in color and consists of two lobes. Its endocrine function complements its role in the immune system, being used for the development and maturation of thymus-derived lymphocytes T-cells. This organ is unusual because its activity peaks during childhood. After adolescence, it slowly shrinks and gets replaced by fat. At its largest, before the onset of puberty, it can weigh nearly 30 gms. The adrenals are placed above the kidney and therefore also known as suprarenal glands. They are yellowish in color, and surrounded by a capsule of fat. They can be seen just under the diaphragm and are connected to that muscular organ by a layer of connective tissue. The adrenal glands consist of an outer medulla and an inner cortex, having distinct secretions and roles within the body. The pancreas plays a dual role, being an integral and important part of both the digestive and endocrine systems. The glandular organ located close to the C-shaped bend of the duodenum, can be seen behind the stomach. It contains cells with an exocrine function that produce digestive enzymes as well as endocrine cells in the islets of Langerhans that produce insulin and glucagon. The hormones play a role in the metabolism and storage of blood glucose and thus the two differing functions of the organ are integrated at a certain level. The gonads also have important endocrine functions that influence the proper development of reproductive organs, the onset of puberty, and maintenance of fertility. Other organs such as the heart, kidney and liver also act as secondary endocrine organs, secreting hormones like erythropoietin that can affect red blood cell production. Diseases of the Endocrine System Diseases of the endocrine system primarily arise from two causes â€" either a change in the level of hormone secreted by a gland, or a change in the sensitivity of the receptors in various cells of the body. Therefore, the body fails to respond in an appropriate manner to main overall homeostasis. Among the most common endocrine diseases is diabetes, which hampers the metabolism of glucose. This has an enormous impact on the quality of life, since adequate glucose is not only important for fueling the body, but maintaining it an appropriate levels also discourages the growth of microorganisms or cancerous cells. Imbalances of hormones from the reproductive system are also significant since they can influence fertility, mood, and wellbeing. The thyroid also needs a crucial micronutrient, iodine, in order to produce its hormone. Dietary deficiency of this mineral can lead to an enlargement of the thyroid gland as the body tries to compensate for low levels of thyroid hormones. Diabetes Diabetes, or diabetes mellitus, refers to a metabolic disease where the blood consistently carries a high concentration of glucose. This is traced back to the lack of effective insulin hormone, produced by the beta cells of the islets of Langerhans in the pancreas. Diabetes mellitus could either arise from a low level of insulin production from the pancreas or an insensitivity of insulin receptors among the cells of the body. Occasionally, pregnant women with no previous history of diabetes develop high blood sugar levels. This can threaten the health of the mother and fetus, as well as increase all the risks associated with childbirth. Insulin is an anabolic hormone that encourages the transport of glucose from the blood into muscle cells or adipose tissue where it can be stored as longer chains of glycogen, or be converted into fat. Concurrently it also inhibits the process of glucose synthesis within cells, by interrupting gluconeogenesis , as well as the breakdown of glycogen. Normally, insulin is secreted when there is spike in blood sugar levels, perhaps after a snack or meal. Its release protects cells from the long-term damage of excess glucose, while also allowing the precious nutrient to be stored and utilized later. Glucagon, another hormone secreted by the pancreas alpha cells , acts in an antagonistic manner to insulin and is secreted when blood sugar levels drop. Hypothyroidism Hypothyroidism is a condition where the body has an insufficient supply of thyroid hormones â€" thyroxine T4 and triiodothyronine T3. Both these hormones contain iodine and are derived from a single amino acid â€" tyrosine. Iodine deficiency is a common cause for hypothyroidism, since the gland is unable to synthesize adequate amounts of hormone. This can arise due to damage to the cells of the thyroid gland through infection or inflammation, or medical interventions for excessive thyroid activity. It can also arise from a deficiency in the pituitary hormone that stimulates the thyroid. Alternatively, it could be due to defects in the receptors for the hormone. Thyroxine is the more common hormone in the blood and has a longer half-life than T3. Hypogonadism Hypogonadism refers to a spectrum of disorders where there is an insufficiency in sex hormones. These are usually secreted by the primary gonads testes and ovaries and affect the development, maturation and functioning of sex organs and the appearance of secondary sexual characteristics. It can arise due to a low level of sex hormone production by the gonads itself, or the

insensitivity of these organs to cues from the brain for hormone production. The first condition is called primary hypogonadism and the latter is called central hypogonadism. Depending on the period of onset, hypogonadism can result in different characteristics. If fetal development was affected, then ambiguous or female genitals can form in male children. During puberty, it can affect the onset of menstruation, breast development and ovulation in females, delay the growth of the penis and testicles, and affect the development of secondary sexual characteristics. It can also impact self-esteem and confidence. In adulthood, hypogonadism leads to reduced sex drive, infertility, fatigue or even loss in bone and muscle mass. Hypogonadism can be diagnosed using blood tests, and often long-term hormone replacement therapy is needed. Related Biology Terms Adrenal hyperplasia â€" Group of disorders relating to the abnormal secretion of hormones from the adrenal cortex. Anabolism â€" The synthesis of complex molecules from simpler ones. Islets of Langerhans â€" Small clusters of cells seen throughout the pancreas that produce hormones. Tyrosine â€" One of twenty standard amino acids. Can be synthesized within the body from phenylalanine. Which of these organs secretes glucagon?

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4: Major Hormones and Functions â€” PT Direct

It is both an endocrine glandâ€”producing several important hormones, including insulin, glucagon, somatostatin, and pancreatic polypeptideâ€”and a digestive organâ€”secreting pancreatic juice containing digestive enzymes that help with the absorption of nutrients and digestion in the small intestine.

Placenta Placenta The placenta is a temporary endocrine organ formed during pregnancy, which produces hormones important in the maintenance of a healthy pregnancy and in preparation for labour and breastfeeding. Where is the placenta? Blood vessels in the placenta bring oxygen and nutrients to the fetus and remove waste products. The umbilical vein red brings oxygenated blood to the fetus from the placenta while the paired umbilical arteries red take deoxygenated fetal blood back towards the placenta. It grows in the wall of the uterus and is attached to the fetus within the uterine cavity by the umbilical cord. The placenta is formed by cells that originate from the fetus and is therefore the first of the fetal organs to develop. What does the placenta do? The placenta contains a complex network of blood vessels that allow the exchange of nutrients and gases between the mother and the developing fetus. The blood supply of the mother does not actually mix with that of the fetus; this exchange occurs by diffusion of gases and transport of nutrients between the two blood supplies see figure. The transfer of nutrients and oxygen from the mother to the fetus, and waste products and carbon dioxide back from the fetus to the mother, allows the growth and development of the fetus throughout pregnancy. Antibodies can also pass from the mother to the fetus, providing protection from certain diseases. This benefit can last for several months after birth. In addition to the transfer of substances, the placenta has two other main functions. It can act as a barrier between the mother and the fetus, preventing some harmful substances in the blood of the mother from damaging the fetus. However, it cannot exclude all harmful substances passing to the fetus. For example, alcohol can cross the placental barrier. The placenta also acts as an endocrine organ, producing several important hormones during pregnancy. These hormones work together to control the growth and development of the placenta and the fetus, and act on the mother to support the pregnancy and prepare for childbirth. What hormones does the placenta produce? The placenta produces two steroid hormones â€” oestrogen and progesterone. Progesterone acts to maintain pregnancy by supporting the lining of the uterus womb , which provides the environment for the fetus and the placenta to grow. Progesterone prevents the shedding of this lining similar to that which occurs at the end of a menstrual cycle , since this would result in pregnancy loss. Progesterone also suppresses the ability of the muscular layer of the uterine wall to contract, which is important in preventing labour from occurring before the end of pregnancy. Oestrogen levels rise towards the end of pregnancy. Oestrogen acts to stimulate the growth of the uterus to accommodate the growing fetus and allows the uterus to contract by countering the effect of progesterone. In this way, it prepares the uterus for labour. Oestrogen also stimulates the growth and development of the mammary glands during pregnancy, in preparation for breastfeeding. Human chorionic gonadotrophin is the first hormone to be released from the developing placenta and is the hormone that is measured in a pregnancy test. The function of human placental lactogen is not completely understood, although, it is thought to promote the growth of the mammary glands in preparation for lactation. A similar role is played by placental growth hormone, which predominates during pregnancy due to suppression of growth hormone produced by the maternal pituitary gland. Relaxin causes the relaxation of pelvic ligaments and softening of the cervix at the end of pregnancy, which aids the process of labour. Kisspeptin is a recently identified hormone, which is important for many aspects of human fertility. A number of other peptide hormones have been recently identified to regulate blood vessel formation within the placenta, which is crucial in allowing the placenta to exchange nutrients from the mother to baby; these peptide hormones include soluble endoglin sEng , soluble fms-like tyrosine kinase 1 sFlt-1 and placental growth factor PlGF. What could go wrong with the placenta? Coloured pelvic magnetic resonance imaging MRI scan of a pregnant woman with placenta praevia. The placenta lower centre is blocking the cervix, the exit to the womb. The placenta can attach very low down in the uterus and may cover the cervical opening into the birth canal. This is known as placenta praevia, and can cause bleeding later in pregnancy and problems with childbirth upon labour. When the placenta grows too

deeply into the wall of the uterus, invading through the lining and into the muscle layer, this is known as placenta accreta. In this situation, the placenta cannot separate normally from the wall of the uterus after childbirth which can cause severe bleeding in the mother. Placental abruption results from premature separation of the placenta from the uterus, before the onset of labour. This can interrupt the blood supply of nutrients and oxygen to the fetus and cause bleeding in the mother. Abnormal formation of the placenta has also been linked with two of the most common pregnancy disorders â€" pre-eclampsia , which causes a set of symptoms including high blood pressure in the mother, and fetal growth restriction, where the baby fails to reach its genetically determined growth potential; both can result in stillbirth and are associated with poor health in later life. Infections involving the placenta may occur, and can be harmful to the foetus if they are passed across the placental barrier. Recent studies have suggested that measuring placental hormones such as sEng, sFlt-1 and PlGF may help to identify women at increased risk of fetal growth restriction and pre-eclampsia.

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5: An Overview Of Endocrine Hormones Secreted By The Liver

Endocrine Gland. Hormone. Exercise effect. Target organ. Major function. Adrenal. Medulla Adrenaline (Epinephrine) Increases with heavy exercise Acts on most cells in the body prolonging and intensifying the sympathetic nervous system response to stress.

The endocrine system plays a role in regulating mood, growth and development, tissue function, metabolism, as well as, sexual function and reproductive processes. The endocrine system includes the areas in our body that regulate and produce hormones. Hormones act out as messengers that allow our cells to communicate and produce a coordinated effect. Without our endocrine system, various parts of the body would work independently from one another. The hormone levels fluctuate through the day and are released in a pulsating manner throughout the hour, day and month. This release is set by the circadian rhythm. Melatonin can be considered the re-set button for the circadian rhythm and it allows the body to recover and repair from daily activities. Melatonin is produced during the stage of deep sleep, making good healthy sleep critical for balancing the endocrine system. What are the top factors that unbalance the endocrine system? Environmental pollutants like exhaust and paint fumes, pesticides, heavy metals, smoking, and estrogens found in water bottles and makeup. A lack of Vitamin D from not getting out in the sun. Vitamin D is a potent modulator of the endocrine system, especially with the sex hormones. Stress â€" will cause a consistent rise in cortisol from the adrenals. This will alter neurotransmitter production and will deplete nutrients needed to produce other hormones and neurotransmitters. These stressors will steal the production line away from other needed hormones and burn through key nutrients such as the B vitamins, zinc, and Vitamin C. Stress can be more than just an emotional stress, it can also be from a physical stress such as imbalanced blood sugar, chronic pain and disease, inflammation, food allergies, and indigestion. The main function of this herb is to reduce the effects of stress on the body. By being an adaptogenic herb, it helps the body adapt to environmental and physical stressors. Eleuthero has also been used by athletes to help improve performance and to minimize the effects of competitive stress. It also has been used during certain treatments such as chemotherapy, radiation, and surgery, as it can sometimes help counter the side effects associated with these treatments. Of course just as is the case with any herb, the effectiveness of Eleuthero depends on the dosage, the part of the plant used and the quality of the herb. While not a true member of the Panax ginseng family, it is an authentic adaptogenic herb, and as such brings about a normalizing effect on your body and can help regulate and enhance your endocrine, nervous, digestive, cardiovascular and immune systems. South American Natives have used Suma to treat wounds, skin rashes, low energy and sexual dysfunction. Suma also has analgesic and anti-inflammatory properties that can help alleviate chronic and acute pain. The root is also quite valuable nutritionally as it contains essential vitamins, minerals, amino acids and trace elements. The overall effect is to give you an increased resistance to stress while having a cell-building and regenerating effect. Suma root is becoming quite popular because of its high content of several plant hormones. If you have questions or want more information please go to http:

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6: Endocrine System

The endocrine system gets some help from organs such as the kidney, liver, heart and gonads, which have secondary endocrine functions. The kidney, for example, secretes hormones such as.

Conclusion What is the Endocrine System? The endocrine system produces hormones which drive your sex drive, it regulates your weight through your thyroid, it helps you sleep through the secretion of melatonin, it helps to provide you with energy through adrenal gland function and much much more. These hormones work together in a complex way to help regulate each other and help you feel healthy. But what happens if you have issues with any one of these organ systems? You may experience serious symptoms ranging from quality of life disturbances fatigue, weight gain, depression to life-threatening conditions. For the purpose of this article, we are primarily going to focus on those issues which affect your quality of life. So if you are experiencing issues such as fatigue, weight gain, depression, chronic pain, low sex drive, inability to build muscle mass, bloating, anxiety, menstrual problems, infertility and so on, then this is the post for you. All of these problems may be attributed to slight disturbances in hormone levels in your body. The more serious issues are rarely ever missed by Doctors, but these chronic quality of life issues may be more difficult to diagnose and manage and may be missed by your Doctor. Conventional Approach to Hormone Management Doctors are great at many things, but hormone management is not one of those things. Doctors are trained to think about hormone balance in your body in a very black and white way. From their perspective, either there is some massive problem such as a huge overdose of hormone in your body, or there is so little hormone floating around that it is basically non-existent. In this way, they rule out the possibility that hormone balance lives on a gradient or on a spectrum. On a spectrum, disease or imbalance can exist to varying degrees until it gets worse and worse and reaches some critical point. You can think of this as your hormones functioning as a percentage of a whole. As this percentage drops you may begin to experience systems which lead you to your Doctors office symptoms such as these in the case of low testosterone. This leaves you feeling poorly for a long period of time as this percentage of hormone function drops over time. Both of these conditions exist on a spectrum with varying degrees of severity. But these diseases are NOT ignored in their early stages, in fact, they are often treated aggressively. The good news is that there are therapies and treatments that you can undergo to potentially help improve your endocrine system if you are feeling poorly. I will focus on the major functions of these organs and what you may experience if there is a problem with your body. This can cause a chain reaction which can often be treated by looking for the "root cause". Keep this in mind as we discuss each system! Also, this is not a complete guide to all of these organ systems. We could write an entire book on each topic indeed, books already exist on these topics! Adrenal Gland Your adrenals sit on top of your kidneys in your abdomen and are probably best known for their ability to produce cortisol and adrenaline. Cortisol is often cited as the energy and stress hormone which is secreted in high amounts when your body is under stress. Adrenaline is another hormone which is secreted during times of "fight or flight" from a portion of your adrenal glands. Adrenaline helps increase blood pressure, regulate your metabolism and so on. Together you can think of your adrenal gland as a gland designed to help you tolerate and manage stress. Stress is something that we all deal with on a daily basis and we all know that a healthy level of stress is a good thing, but what happens when stress becomes too much? This is the idea behind the diagnosis of "adrenal fatigue". Those with adrenal fatigue often experience the following: Constant and chronic daily fatigue Sensation of feeling wired but tired Reliance on caffeine for energy Cravings for sugary and salty foods Afternoon crash around pm Inability to fall asleep despite feeling exhausted Reduced quality of sleep One of the main problems with adrenal fatigue is that people who experience the symptoms associated with this condition often have normal cortisol levels. But should it be? It certainly remains logical that constant and perpetual stress may lead to negative consequences in the body. We know from many studies that excessive stress leads to sleep problems, hormone imbalance and weight gain. Perhaps the concept behind adrenal fatigue is better explained by changes which occur at the receptor level as opposed to absolute changes to hormone levels in the body. The good news is that if you are experiencing these symptoms you may find relief with basic changes such as

meditation , improved sleep, changes to your diet, the use of certain supplements and other stress reduction techniques. Thyroid Gland Your thyroid gland sits at the base of your neck and produces thyroid hormone. Your thyroid is most known for its ability to help regulate your metabolism through the most powerful thyroid hormone T3 triiodothyronine. T3 is secreted directly from the thyroid gland but also produced through the conversion process from T4 thyroxine. An excess of thyroid hormone such as seen in hyperthyroidism causes your entire body to "speed up". Those with hyperthyroidism experience symptoms such as diarrhea, rapid heart rate, weight loss and hair loss. Those with hypothyroidism experience the exact opposite as their entire body "slows down". Those with hypothyroidism may experience symptoms such as weight gain, depression, constipation, a slower than normal heart rate, a low body temperature and dry skin. Thyroid problems can be easily diagnosed and assessed with simple routine blood tests. While diagnosis remains simple, management of thyroid disease remains somewhat controversial.

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7: Why Is The Endocrine System So Important?

Hormones in the human body. Hormone is a chemical substance (or a chemical message) that controls and organizes most of the vital activities and functions in the bodies of living organisms, Hormones are secreted in the body by some organs called Endocrine glands or Ductless glands.

How can chemicals affect endocrine systems? Why are Hormones Important? Hormones act as chemical messengers that are released into the blood stream to act on an organ in another part of the body. Although hormones reach all parts of the body, only target cells with compatible receptors are equipped to respond. Over 50 hormones have been identified in humans and other vertebrates. Hormones control or regulate many biological processes and are often produced in exceptionally low amounts within the body. Examples of such processes include: Much like a lock and key, many hormones act by binding to receptors that are produced within cells. The hormone-receptor complex switches on or switches off specific biological processes in cells, tissues, and organs. Some examples of hormones include: Estrogens are the group of hormones responsible for female sexual development. They are produced primarily by the ovaries and in small amounts by the adrenal glands. Androgens are responsible for male sex characteristics. Testosterone, the sex hormone produced by the testicles, is an androgen. The thyroid gland secretes two main hormones, thyroxine and triiodothyronine, into the bloodstream. These thyroid hormones stimulate all the cells in the body and control biological processes such as growth, reproduction, development, and metabolism. The female ovaries, male testes, and pituitary, thyroid, and adrenal glands are major constituents of the endocrine system. Hypothalamus - The hypothalamus links our endocrine and nervous systems together. The hypothalamus drives the endocrine system. This gland has two lobes, the posterior and anterior lobes. The posterior lobe secretes hormones that are made by the hypothalamus. The anterior lobe produces its own hormones, several of which act on other endocrine glands. Both hormones help regulate the concentration of glucose sugar in the blood. The major categories of gonadal steroids are androgens, estrogens, and progestins, all of which are found in both males and females but at different levels. It is important to gain a better understanding of what concentrations of chemicals found in the environment may cause an adverse effect. Various types of scientific studies epidemiology, mammalian toxicology, and ecological toxicology are necessary to resolve many of the scientific questions and uncertainty surrounding the endocrine disruptor issue. Many such studies are currently underway by government agencies, industry, and academia. Contact Us to ask a question, provide feedback, or report a problem.

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8: 11 Surprising Facts About the Endocrine System

The Endocrine System Access more 3D visualizations by downloading the Hormone Health Network's 3D Patient Education mobile app! The endocrine system is a series of glands that produce and secrete hormones that the body uses for a wide range of functions.

There are 2 types of glands. Exocrine glands have ducts or channels which secrete chemicals such as saliva or sweat. Endocrine glands do not have ducts; they secrete hormones directly into the blood stream. Organs of the Endocrine System Hypothalamus The hypothalamus is located in the brain and links the nervous and endocrine systems to each other. It secrets hormones that put the pituitary gland into action. Pineal Gland The pineal gland is a small, pine-cone shaped endocrine gland in the brain. Pituitary gland The pituitary gland, or hypophysis, is an endocrine gland about the size of a pea. It weighs less than an ounce and is one of the most important organs in the body. It is located at the base of the brain and is closely connected to the hypothalamus. The pituitary gland secretes nine hormones that regulate homeostasis by stimulating other endocrine glands to produce and secrete their own hormones. This particular gland has two components: The anterior lobe makes up most of the gland and releases the majority of the hormones. The smaller posterior lobe stores hormones but does not make them. It links the endocrine system with the nervous system by way of the hypothalamus. The hypothalamus controls the production of hormones in both lobes. The pituitary gland produces many important hormones, some of which act on other glands to make them produce hormones. Thyroid The butter-fly shaped thyroid gland is one of the largest endocrine glands. The isthmus bridges the two lobes of the thyroid and is located below the cricoid cartilage. The thyroid gland controls how quickly the body uses energy metabolism , calcium levels in the blood, how the body makes proteins, and how sensitive the body is to other hormones. It produces thyroid hormones, the principal ones being triiodothyronine T3 , thyroxine which can sometimes be called tetraiodothyronine T4 and calcitonin. These hormones regulate the heart rate, the rate of metabolism and affect the growth and rate of function of many other systems in the body. T3 and T4 are made from iodine and tyrosine. Calcitonin slows down the rate at which bone is broken down decreasing the amount of calcium dissolved in the blood. Parathyroid Gland The parathyroid gland controls calcium levels in the blood. The parathyroid is a small of glands around by the thyroid gland. They produce the parathyroid hormone or PTH, which increases the rate at which broke bone is broken down. As a result, more calcium is released into the blood. Parathyroid hormone works in partnership with calcitonin from the thyroid gland. The 2 hormones have the opposite effect. Through negative feedback they keep the calcium level in the blood stable. Hormonal output from the thyroid is regulated by the thyroid-stimulating hormone TSH produced by the anterior pituitary, which itself is regulated by thyrotropin-releasing hormone TRH produced by the hypothalamus. The most common problems of the thyroid gland are overactive thyroid gland, called hyperthyroidism, and an underactive thyroid gland, called hypothyroidism. Thymus The thymus is a specialized organ of the immune system. Adrenal Glands The small, triangular adrenal glands also known as suprarenal glands sit atop the kidneys. Each is divided into two distinct anatomic and functional organs. The adrenal cortex the outer region which secretes corticosteroid hormones that affect metabolism that is how food is stored and used , chemicals in the blood, and characteristics such as body shape and hairiness. They are mainly responsible for releasing hormones in response to stress through the synthesis of corticosteroids such as cortisol and catecholamines such as epinephrine adrenaline and norepinephrine. They also produce androgens. The adrenal glands affect kidney function through the secretion of aldosterone, a hormone that helps regulate the osmolarity of blood plasma. The adrenal glands help us deal with dress and as well as maintain homeostasis. Disorders of the adrenal glands include congenital defects such as adrenal hyperplasia, tumors, autoimmune disorders, infection, and impaired blood supply. Adrenal cortex When looked at under a microscope, the adrenal cortex is made up of 3 distinct zones. The outermost zone secretes the hormone aldosterone, which inhibits the amount of sodium excreted in the urine, maintaining blood pressure and blood volume. The inner and middle zones together secrete hormones hydrocortisone, also called cortisol, corticosterone, as well as small amounts of androgen hormones. The rate of release and amount of secretion is

controlled by other hormones made in the hypothalamus and pituitary. Adrenal medulla The adrenal medulla is closely related to nervous tissue and secretes the hormone epinephrine and norepinephrine in response to stimulation by sympathetic nerves. These nerves are most active at times of stress. The release of these hormones increases the heart rate in order to pump more blood to the large skeletal muscles. The airways in the lungs are increased so that more oxygen can be taken in. As more blood is sent to the active organs less blood is sent to the internal organs. Pancreas The pancreas is a gland organ in the digestive system and endocrine system. It is both an endocrine glandâ€"producing several important hormones, including insulin, glucagon, somatostatin, and pancreatic polypeptideâ€"and a digestive organâ€"secreting pancreatic juice containing digestive enzymes that help with the absorption of nutrients and digestion in the small intestine. These enzymes help to break down the carbohydrates, proteins, and fats. Ovaries The ovary is an ovum-producing reproductive organ, often found in pairs in the female reproductive system. Ovaries in women are analogous to testes in malesâ€"they are both gonads and endocrine glands. Our ovaries produce estrogen, progesterone, relaxin and inhibin. Testes The testicle is the male gonad. Like the ovaries in women to which they are homologous, testes are components of both the reproductive system and the endocrine system. The primary functions of the testes are to produce inhibin, sperm spermatogenesis and androgens, primarily testosterone. Hormones Hormones are powerful chemical messengers that our endocrine system uses to control various processes in our body. Hormones can be fat-soluble or water-soluble. Endocrine glands secrete hormones into the blood stream near them; the hormones then travel in our bloodstream until it reaches its destination, called a target cell, in distance parts of the body. This chemical changes inside the target cells and adjusts the rate at which a specific action happens, such as a contraction of the muscle. Hormones can have one target or several targets. Hormones are released when they get feedback from triggers. Some hormones work on specific cells while other hormones work throughout the body. The level of hormones in the body are controlled by feedback. It is important that the amount of hormones in our body is kept at the right level. Although hormones come in contact with many cells in the body, they only react with target cells. A hormone can have more than one target cell, and can have different effects on different targets. Luteininzing Hormone This is a pituitary hormone that helps regulate the function of the reproductive organs. In men it triggers the testes to produce male reproductive hormones. Prolactin This is a pituitary hormone that stimulates the production of milk in the breast. It is one of several hormones that stimulate milk production or lactation. Breast-feeding stimulates the pituitary gland to make more prolactin so that milk is made for as long as the baby breastfeeds. Oxytocin Oxytocin is a pituitary hormone that stimulates muscle contractions in the uterus during childbirth. These contractions cause the release of more oxytocin. This is a positive feedback reaction that makes the cycle continue until the baby is born. Oxytocin also stimulates the breasts to release milk when the baby feeds. Glucagon The hormone glucagon increases the level of sugar in the blood. It plays a vital part in maintaining the correct blood sugar level. It is made by the pancreas, a gland that is part of the endocrine system and the digestive system. The pancreas releases glucagon when the blood sugar level starts to fall. Glucogon makes cells release glucose, and helps convert glycogen, the form of glucose stored in the liver, back to glucose. As a result the blood sugar level rises. Your blood has enough glucose to keep you alive for just 15 min. However, as glucose is used up, more is released to take its place. Reproductive Hormones Reproductive hormones control the reproductive development of boys and girls. The development of primary and secondary characteristics and regulate all reproductive related processes such as sperm and egg production. Primary reproductive characteristics are the development of the major reproductive organs. There are 3 main types of reproductive hormonesâ€"androgens, estrogen, and progesterone. Female Reproductive Hormone Estrogen is the female hormone made mainly in the ovaries. It not only makes the girl reproductive organs develop, and controls her monthly menstrual cycle. Progesterone is the female hormone that prepares the girls uterus for pregnancy every month. Some contraceptive pills have estrogen in them to prevent the ovaries from releasing their egg cells. Male Reproductive Hormone The male reproductive system consists of the penis, scrotum, and the 2 testes. A male reproductive system creates sperm cells that combined with a female egg to create a new human life. The testes and scrotum hang outside the body where it is cooler because it improves sperm production. Sperm cells look like microscopic tadpoles.

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These hormones act as chemical signals which regulate various functions of the body such as growth of muscles, bones and hair, maturity of reproductive organs, etc. Hormones can be understood as chemical equivalents of electrical brain signals.

October 12, Like the nervous system, the endocrine system is an information signal system. But rather than using neurons, it uses chemical messengers called hormones, each of which has its own unique function. Here are 11 interesting facts that may surprise you about the endocrine system, its glands and its hormones. Charles Taylor , Shutterstock Traditional Chinese healers practiced endocrinology more than 2, years ago. Temple in his book, "The Genius of China: As far back as B. They used these extracts for medicinal purposes. X-Ray Photo via Shutterstock The endocrine system is sometimes at fault for osteoporosis. Osteoporosis is a common disease in aging people, and makes bones less dense and more prone to fractures. Nearly one in 10 older adults in the U. Though osteoporosis is often thought of as strictly a bone disorder, it often falls under the treatment of endocrinologists because of its underlying causes. In particular, postmenopausal women sometimes develop the disease because of their low levels of the hormone estrogen, which helps to maintain bone mass. In such cases, osteoporosis may be treated with hormone replacement therapy. The condition can also arise as a result of other endocrine disorders, such as hyperthyroidism overactive thyroid. People with such conditions are considered to have "secondary osteoporosis. In the s, scientists began to think that some sort of chemical communication must take place between different organs in the body, and they later recognized that certain disorders could be treated with extracts from endocrine tissues. In , English physiologists William Bayliss and Ernest Starling concluded that chemicals â€” which they later named hormones â€” controlled the secretions of the pancreas. This idea ran contrary to the prevailing view that neural reflexes triggered the secretions. Scientists later discovered that both hormonal and neural processes played a role in pancreatic secretions. The new term sparked intense research on the endocrine system in the first half of the 20th century, and scientists fervently worked to identify and understand the various hormones in the body. The eight hormone-secreting glands of the endocrine system are the adrenal gland, hypothalamus, pancreas, parathyroid gland, pineal gland, pituitary gland, reproductive glands ovaries and testes and thyroid gland. But some other organs and tissues that are not generally considered part of the endocrine system also produce and secrete hormones. For instance, the placenta of a pregnant woman secretes a few hormones, including estrogen and progesterone. And the stomach releases the hunger-inducing hormone ghrelin and the hormone gastrin, which stimulates the secretion of gastric acid. Urine sample via Shutterstock Diabetes was once diagnosed by tasting urine. Diabetes â€” a disease in which the pancreas stops producing insulin, the hormone that regulates blood sugar levels â€” is the most common endocrine disorder in the U. Today, physicians use blood tests to diagnose the disease, but a different method was once common. The human pancreas diagram via Shutterstock The pancreas bridges two worlds. There are two types of glands in the body: Exocrine glands â€” which include the salivary glands, sweat glands and mammary glands â€” excrete their products through ducts. Endocrine glands, by contrast, release their products hormones without ducts, directly into the bloodstream. The pancreas has both endocrine and exocrine functions. On one hand, it releases a number of hormones, including insulin and glucagon, into the bloodstream. But it also secretes a pancreatic juice that contains important digestive enzymes via ducts into the small intestine. Alcohol image via Shutterstock Alcohol has widespread effects on the endocrine system. But scientists have known for decades that alcohol also has widespread effects on the endocrine system. For example, alcohol can impair the regulation of blood-sugar levels by interfering with certain hormones, reduce testosterone levels in men by damaging the testes and increase the risk of osteoporosis by messing with a calcium-regulating hormone called parathyroid hormone, according to the National Institute on Alcohol Abuse and Alcoholism. In the late 19th century and early 20th century, many endocrine-system studies were conducted on dogs, rather than on more typical lab animals, such as mice and guinea pigs. In , German physiologist Oskar Minkowski and German physician Josef von Mering induced diabetes in dogs by removing their pancreases. Five years later, English physiologist Sir Edward Albert

Sharpey-Schafer and English physician George Oliver took extracts from the adrenal glands of dogs and injected them into other dogs, which resulted in hypertension and rapid heartbeat because of the adrenaline present in the injected substances. Dogs were even the test subjects in the landmark study that led to the coining of the term "hormone. However, reimplanting their testes reversed these effects. Berthold concluded that the testes excreted a substance that affected the blood; the blood, in turn, acted upon the rest of the body. He injected himself with extracts from dog and guinea-pig testes in a pioneering attempt at a kind of hormone replacement therapy. In the journal The Lancet, the year-old scientist reported that the treatment rejuvenated him, restoring his strength, digestive functions and "intellectual labor. Stress Image via Shutterstock Stress kicks the endocrine system into high gear. In response to stress, the endocrine system quickly secretes various hormones at higher-than-normal levels in order to help the body mobilize more energy and adapt to new circumstances. For example, the pituitary-adrenal axis starts releasing adrenaline to increase the volume of blood pumped out by the heart and the blood flowing to the skeletal muscles. And during acute physical stress, the pituitary gland may also ramp up the secretion of the growth hormone, which enhances metabolic activity. Unlike humans and other animals, plants do not have an endocrine system or endocrine glands. But they do have hormones, which affect various processes related to plant growth, including gene expression, metabolism and cell division. Plant cells sometimes produce hormones to use locally, but they may also transport the chemicals to other areas using specialized elongated cells or other means. Knowing that plants use hormones to guide their growth, agriculturalists have been using hormonelike chemicals called "plant growth regulators" since the s to improve or otherwise modify the growth of their crops, according to University of Florida agronomist Frederick Fishel.

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