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Chapter 1 : Paracrine Factors - Developmental Biology - NCBI Bookshelf

Some of the factors that affect endocrine organs include puberty, aging, pregnancy, the environment, genetics and certain diseases and medications, including naturopathic medicine, herbal supplements, and prescription medicines such as opioids or steroids.

Sinauer Associates ; Search term Paracrine Factors How are the signals between inducer and responder transmitted? Other inductions, however, were blocked by the filter. The researchers therefore concluded that some of the inductive molecules were soluble factors that could pass through the small pores of the filter, and that other inductive events required physical contact between the epithelial and mesenchymal cells Figure 6. When cell membrane proteins on one cell surface interact with receptor proteins on adjacent cell surfaces, these events are called juxtacrine interactions since the cell membranes are juxtaposed. When proteins synthesized by one cell can diffuse over small distances to induce changes in neighboring cells, the event is called a paracrine interaction, and the diffusible proteins are called paracrine factors or growth and differentiation factors GDFs. We will consider paracrine interactions first and then return to juxtacrine interactions later in the chapter. Presumptive mouse lens ectoderm and mesenchyme were placed on a filter. Retinal tissue was placed beneath it. After 3 days, a lens had developed from the surface ectoderm. In the absence of more Whereas endocrine factors hormones travel through the blood to exert their effects, paracrine factors are secreted into the immediate spaces around the cell producing them. During the past decade, developmental biologists have discovered that the induction of numerous organs is actually effected by a relatively small set of paracrine factors. Moreover, the same proteins are utilized throughout the animal kingdom; the factors active in creating the Drosophila eye or heart are very similar to those used in generating mammalian organs. Many of these paracrine factors can be grouped into four major families on the basis of their structures. The fibroblast growth factors The fibroblast growth factor FGF family currently has over a dozen structurally related members. Over a dozen distinct FGF genes are known in vertebrates, and they can generate hundreds of protein isoforms by varying their RNA splicing or initiation codons in different tissues Lappi As we will discuss later in this chapter, receptor tyrosine kinases are proteins that extend through the cell membrane Figure 6. On the extracellular side is the portion of the protein that binds the paracrine factor. On the intracellular side is a dormant tyrosine kinase i. The proteins are now activated and can perform new functions. FGFs are associated with several developmental functions, including angiogenesis blood vessel formation , mesoderm formation, and axon extension. While FGFs can often substitute for one another, their expression patterns give them separate functions. FGF2 is especially important in angiogenesis, and FGF8 is important for the development of the midbrain and limbs Figure 6. A Structure of a receptor tyrosine kinase. The dormant tyrosine kinase is activated by the binding of FGF by the extracellular portion of the receptor protein. This enzyme activity phosphorylates specific tyrosine residues of certain more The binding of FGFs to their receptors is a complex acrobatic act involving an interesting cast of cell surface molecules. Glycoproteins play a major supporting role in this event. Vertebrates have at least three homologues of the Drosophila hedgehog gene: Desert hedgehog is expressed in the Sertoli cells of the testes, and mice homozygous for a null allele of dhh exhibit defective spermatogenesis. Indian hedgehog is expressed in the gut and in cartilage and is important in postnatal bone growth Bitgood and McMahon ; Bitgood et al. Made by the notochord, it is processed so that only the amino-terminal two-thirds of the molecule is secreted. This peptide is responsible for patterning the neural tube such that motor neurons are formed from the ventral neurons and sensory neurons are formed from the dorsal neurons see Chapter 12; Yamada et al. Sonic hedgehog is also responsible for patterning the somites so that the portion of the somite closest to the notochord becomes the cartilage of the spine Fan and Tessier-Lavigne ; Johnson et al. As we will see in later chapters, Sonic hedgehog has been shown to mediate the formation of the left-right axis in chicks, to initiate the anterior-posterior axis in limbs, to induce the regionally specific differentiation of the digestive tube, and to induce feather formation see Figures 6. Sonic hedgehog often works with other paracrine factors, such as Wnt and FGF proteins. In the developing tooth, Sonic hedgehog, FGF4, and other paracrine factors are

concentrated in the region where cell interactions are creating the cusps of the teeth see Figure The sonic hedgehog gene is shown by in situ hybridization to be expressed in the 3-day embryonic chick nervous system red arrow , gut blue arrow , and limb bud black arrow. Photograph courtesy of C. While Sonic hedgehog is used to induce and specify numerous tissues in the embryo, Desert hedgehog and Indian hedgehog are used postnatally to regulate bone growth and sperm production. There are at least 15 members of this family in vertebrates. Their name comes from fusing the name of the Drosophila segment polarity gene wingless with the name of one of its vertebrate homologues, integrated. While Sonic hedgehog is important in patterning the ventral portion of the somites causing the cells to become cartilage , Wnt1 appears to be active in inducing the dorsal cells of the somites to become muscle McMahon and Bradley ; Stern et al. Wnt proteins also are critical in establishing the polarity of insect and vertebrate limbs, and they are used in several steps of urogenital system development Figure 6. Wnt proteins play several roles in the development of the urogenital organs. Wnt4 is necessary for kidney developnent and for female sex determination. A Whole-mount in situ hybirdization of Wnt4 expression in a day mouse embryonic male urogenital more The biochemistry of the Wnt proteins and the mechanism of their actions is a fascinating tale of theme and variations. The Wnt family may be one of the oldest group of signaling molecules in the animal kingdom. The members of the BMP family were originally discovered by their ability to induce bone formation; hence, they are the bone morphogenetic proteins. Bone formation, however, is only one of their many functions, and they have been found to regulate cell division, apoptosis programmed cell death , cell migration, and differentiation Hogan The BMPs include proteins such as Nodal responsible for left-right axis formation and BMP4 important in neural tube polarity, eye development, and cell death; see Figure 4. As it turns out, BMP1 is not a member of the family; it is a protease. Other paracrine factors Although most of the paracrine factors are members of the above-mentioned four families, some have few or no close relatives. Factors such as epidermal growth factor, hepatocyte growth factor, neurotrophins, and stem cell factor are not in the above-mentioned families, but each plays important roles during development. In addition, there are numerous factors involved almost exclusively with developing blood cells: These factors will be discussed when we detail blood cell formation in Chapter Activin, for instance, can diffuse over many cell diameters and can induce different sets of genes at different concentrations Gurdon et al. These factors may induce the expression of other short-range factors from these neighbors, and a cascade of paracrine inductions can be initiated. In addition to endocrine, paracrine, and juxtacrine regulation, there is also autocrine regulation. Autocrine regulation occurs when the same cells that secrete paracrine factors also respond to them. In this case, the cell synthesizes a molecule for which it has its own receptor. Although autocrine regulation is not common, it is seen in placental cytotrophoblast cells; these cells synthesize and secrete platelet-derived growth factor, whose receptor is on the cytotrophoblast cell membrane Goustin et al. The result is the explosive proliferation of that tissue. The original hedgehog gene was found in Drosophila, in which genes are named after their mutant phenotype. The loss-of-function hedgehog mutation in Drosophila causes the fly embryo to be covered with pointy denticles on its cuticle. Hence, it looks like a hedgehog. The vertebrate hedgehog genes were discovered by searching chick gene libraries with probes that would find sequences similar to that of the fruit fly hedgehog gene. Two were named after species of hedgehogs, the third was named after the cartoon character. By agreement with the publisher, this book is accessible by the search feature, but cannot be browsed.

Chapter 2 : CANC_Cancer_Type_icon

The endocrine system is a chemical messenger system consisting of hormones, the group of glands of an organism that carry those hormones directly into the circulatory system to be secreted to distant target organs, and the feedback loops of homeostasis that the hormones drive.

Endocrinology mainly focuses on the endocrine organs, such as pituitary, thyroid, adrenals, ovaries, testes, pancreas, secretions called hormones, also its diseases and other syndromes. The journal is using Editorial Manager System for quality in peer review process. Editorial Manager is an online manuscript submission, review and tracking systems. Authors may submit manuscripts and track their progress through the system, hopefully to publication. Reviewers can download manuscripts and submit their opinions to the editor. Behavioral Endocrinology Behavioural Endocrinology is a study of hormones and their influence on the regular behaviour of the animals. Studies related to behavioural endocrinology have assessed that there is a casual relationship between the presence of a hormone in the circulatory system and the occurrence of certain behavioural patterns. They have also concluded that the frequency of the behaviour alters if the endocrine gland producing hormone is removed. Paediatric Endocrinology Paediatric Endocrinology is a study which deals with variations in physical growth and sexual development in the childhood age; which are inclusive of diabetes as well as other endocrine disorders. The next is growth and intersex disorders where includes; variations of puberty, adolescent gynaecology and many more. Cellular Endocrinology Cellular Endocrinology deals with all the related aspects of biochemical mechanisms, synthesis and production of extracellular signal transductions , and the other mechanism in the hormonal control. This study also includes hormone regulated gene expression, structures and physiochemical properties of hormones, generation, action and role of intracellular signals such as cyclic nucleotides and calcium etc. Endocrinologist Communication Endocrinologists are the specially trained persons who are expertise in diagnosing diseases related to the glands. They are trained to treat diseases which affect different organs in the body beyond the glands. The primary care doctors know more about the human anatomy ; so for the diseases; directly related to the glands they suggest them to communicate with the Endocrinologists. The main goal in this communication is to restore the normal balance of hormones in the body. Augmentative and Alternative Communication, Communication and Medicine Endocrinology Case Reports Endocrinology case report is a comprehensive literature of the symptoms, signs, diagnosis, treatment and follow-up of an individual diseased patient. The report contains the demographic profile which describes either the unusual or the novel occurrence. The Endocrinology case reports is all about various endocrine disorders their unusual occurrence, treatment and the follow up of the diseased patient. Case Reports, International Medical Case Reports Journal Comparative Endocrinology Each and every mechanism of hormones and their actions on various glands is considered as a general happening and specifically with respect to each of the vertebrate and invertebrate hormones. So, Comparative Endocrinology is all about comparing the complexities between vertebrate and invertebrate endocrine systems at various levels Sub-molecular, molecular, cellular and organismal levels. These interactions include the biological systems of the cells involved and the physiological processes of the human body. The neuroendocrine system is the mechanism where the hypothalamus maintains homeostasis, regulating reproduction, metabolism, energy utilisation and hypertension. It can be described as a common change that every woman undergo before the end of reproductive period. This occurs when the ovaries no longer can release egg every month. Irregular periods, heavy mood swings, racing heart and vaginal dryness are some of the common symptoms seen during this condition. These tumours may be of different types; Gastro midgut carcinoids, appendix carcinoids , etc. Endocrine System Diseases can be broadly classified into three categories. Hyper-secretion of the endocrine glands 2. Hypo-secretion of endocrine gland 3. Tumours of the endocrine gland. Adrenal disorders, glucose homeostasis disorders, thyroid disorders, calcium homeostasis disorders, pituitary and sex hormone disorders are some of the most common disorders found. Diabetes Diabetes is a chronic condition that badly affects the ability of the body to utilise the energy intake from the food. The highest percentage of this disease can be found in the obese people. Studies have concluded that

there is no permanent cure for this disease but the condition can be controlled with proper diet, weight management, good nutrition intake and exercise. Parathyroid A healthy human body has four glands just below the thyroid called as parathyroid glands. These glands are noway related with the functioning of thyroid gland but acts as a thermal regulator that controls the levels of calcium in the blood. The calcium sensing receptors attached to the parathyroid gland helps in maintaining the calcium levels in the blood. Low blood condition, primary hyperparathyroidism, secondary hyperparathyroidism are the common parathyroid conditions. Endocrinologist Endocrinologists are the specially trained persons who are expertise in diagnosing diseases related to the glands. Infertility Infertility is defined as the inability to conceive after having a regular unprotected sex. It refers to a couple that has not conceived after one year of regular sexual intercourse without using any contraception. Ages, smoking, excess alcohol consumption, being obese , sexually transmitted diseases are some of the major risk factors for obesity. Hormonal Imbalance Hormones are the chemical mutagens that travel along the blood stream to the organs and tissues. Hormonal imbalance is a condition where there is an elevated level of estrogen and lowered levels of progesterone. The common cause for the hormonal imbalance is because of the alterations in the ideal ratio of estrogen and progesterone. Fatigue, skin problems, weight gain, mood swings, diminished sex drive are some of the symptoms of hormonal imbalance. These glands produce the vital hormones cortisol, sex hormones etc. So, the too much or very little amount of hormone producing leads to adrenal disorders. Related Journals of Adrenal Disorders Reviews in Endocrinology and Metabolic Disorders , Endocrinology Journals List Calcium Homeostasis Calcium homeostasis is regulating the concentration of calcium ions present in the extracellular fluid. This act of regulating the concentration is highly controlled as they have a stabilizing effect on voltage gated ion channels. When the calcium level in the extra cellular fluid is too low, the condition is called as hypocalcaemia and in converse when the voltage gated channels open and release calcium in a higher concentration, the condition is called as hypercalcemia. It exists in all forms of life where it modulates the required energy intake in order to maintain metabolic needs. Appetite is the only behavioural aspect which needs intake of energy whereas all other behavioural aspects; affects the release of energy.

Chapter 3 : Risk Factors - Medical Conditions Hormonal/Endocrine Disorders

Endocrine covers the following leading topics in Endocrinology such as: Neuroendocrinology, Pituitary and hypothalamic peptides, thyroid physiological and clinical aspects, bone and mineral metabolism and osteoporosis, obesity, lipid and energy metabolism and food intake control, insulin, type 1 and type 2 diabetes, hormones of male and female.

The control of release of hormones from the pituitary is via negative feedback from the target gland. For example homeostasis of thyroid hormones is achieved by the following mechanism; TRH from the hypothalamus stimulates the release of TSH from the anterior pituitary. The TSH, in turn, stimulates the release of thyroid hormones form the thyroid gland. The heart, gastrointestinal tract, the placenta, the kidneys and the skin, whose major function is not the secretion of hormones, also contain some specialized cells that produce hormones. In addition, all cells, except red blood cells secrete a class of hormones called eicosanoids. These hormones are paracrines, or local hormones, that primarily affect neighboring cells. Two groups of eicosanoids, the prostaglandins PGs and the leukotrienes LTs , have a wide range of varying effects that depend upon the nature of the target cell. Eicosanoid activity, for example, may impact blood pressure, blood clotting, immune and inflammatory responses, reproductive processes, and the contraction of smooth muscles. Antagonistic Hormones[edit] Maintaining homeostasis often requires conditions to be limited to a narrow range. When conditions exceed the upper limit of homeostasis, specific action, usually the production of a hormone is triggered. When conditions return to normal, hormone production is discontinued. If conditions exceed the lower limits of homeostasis, a different action, usually the production of a second hormone is triggered. Hormones that act to return body conditions to within acceptable limits from opposite extremes are called antagonistic hormones. The two glands that are the most responsible for homeostasis is the thyroid and the parathyroid. The regulation of blood glucose concentration through negative feedback illustrates how the endocrine system maintains homeostasis by the action of antagonistic hormones. Bundles of cells in the pancreas called the islets of Langerhans contain two kinds of cells, alpha cells and beta cells. These cells control blood glucose concentration by producing the antagonistic hormones insulin and glucagon. Beta cells secrete insulin. When the concentration of blood glucose raises such in after eating, beta cells secret insulin into the blood. Insulin stimulates the liver and most other body cells to absorb glucose. Liver and muscle cells convert glucose to glycogen, for short term storage, and adipose cells convert glucose to fat. In response, glucose concentration decreases in the blood, and insulin secretion discontinues through negative feedback from declining levels of glucose. Alpha cells secrete glucagon. When the concentration of blood glucose drops such as during exercise, alpha cells secrete glucagon into the blood. Glucagon stimulates the liver to release glucose. The glucose in the liver originates from the breakdown of glycogen. Glucagon also stimulates the production of ketone bodies from amino acids and fatty acids. Ketone bodies are an alternative energy source to glucose for some tissues. When blood glucose levels return to normal, glucagon secretion discontinues through negative feedback. Calcitonin CT produces the opposite effect by inhibiting the breakdown of bone matrix and decreasing the release of calcium in the blood. Thyroid gland[edit] The Thyroid gland is one of the largest endocrine glands in the body. It is positioned on the neck just below the Larynx and has two lobes with one on either side of the trachea. It is involved in the production of the hormones T3 triiodothyronine and T4 thyroxine. The thyroid also produces and releases the hormone calcitonin thyrocalcitonin which contributes to the regulation of blood calcium levels. Thyrocalcitonin or calcitonin decreases the concentration of calcium in the blood. Most of the calcium removed from the blood is stored in the bones. The thyroid hormone consists of two components, thyroxine and iodine. This hormone increases the metabolism of most body cells. A deficiency of iodine in the diet leads to the enlargement of the thyroid gland, known as a simple goiter. Hypothyroidism during early development leads to cretinism. In adults, it produces myxedema, characterized by obesity and lethargy. Hyperthyroidism leads to a condition known as exophthalmic goiter, characterized by weight loss as well as hyperactive and irritable behavior. The thyroid gland is a two-lobed gland that manifests a remarkably powerful active transport mechanism for up-taking iodide ions from the blood. As blood flows through the gland, iodide is converted to an active form of iodine. This iodine combines with an amino acid

called tyrosine. Two molecules of iodinated tyrosine then combine to form thryroxine. Following its formation, the thyroxine becomes bound to a polysaccharide-protein material called thyroglobulin. The normal thyroid gland may store several weeks supply of thyroxine in this bound form. An enzymatic splitting of the thyroxine from the thyroglobulin occurs when a specific hormone is released into the blood. This hormone, produced by the pituitary gland, is known as thyroid-stimulating hormone TSH. TSH stimulates certain major rate-limiting steps in thyroxine secretion, and thereby alters its rate of release. A variety of bodily defects, either dietary, hereditary, or disease induced, may decrease the amount of thyroxine released into the blood. The most popular of these defects is one that results from dietary iodine deficiency. The thyroid gland enlarges, in the continued presence of TSH from the pituitary, to form a goiter. This is a futile attempt to synthesize thyroid hormones, for iodine levels that are too low. Normally, thyroid hormones act via a negative feedback loop on the pituitary to decrease stimulation of the thyroid. In goiter, the feedback loop cannot be in operation - hence continual stimulation of the thyroid and the inevitable protuberance on the neck. Formerly, the principal source of iodine came from seafood. As a result, goiter was prevalent amongst inland areas far removed from the sea. Today, the incidence of goiter has been drastically reduced by adding iodine to table salt. Thyroxine serves to stimulate oxidative metabolism in cells; it increases the oxygen consumption and heat production of most body tissues, a notable exception being the brain. Thyroxine is also necessary for normal growth. The most likely explanation being that thyroxine promotes the effects of growth hormone on protein synthesis. The absence of thyroxine significantly reduces the ability of growth hormone to stimulate amino acid uptake and RNA synthesis. Thyroxine also plays a crucial role in the closely related area of organ development, particularly that of the central nervous system. If there is an insufficient amount of thyroxine, a condition referred to as hypothyroidism results. Symptoms of hypothyroidism stem from the fact that there is a reduction in the rate of oxidative energy-releasing reactions within the body cells. Usually the patient shows puffy skin, sluggishness, and lowered vitality. Other symptoms of hypothyroidism include weight gain, decreased libido, inability to tolerate cold, muscle pain and spasm, and brittle nails. Hypothyroidism in children, a condition known as cretinism, can result in mental retardation, dwarfism, and permanent sexual immaturity. Sometimes the thyroid gland produces too much thyroxine, a condition known as hyperthyroidism. This condition produces symptoms such as an abnormally high body temperature, profuse sweating, high blood pressure, loss of weight, irritability, insomnia and muscular pain and weakness. It also causes the characteristic symptom of the eyeballs protruding from the skull called exopthalmia. This is surprising because it is not a symptom usually related to a fast metabolism. Hyperthyroidism has been treated by partial removal or by partial radiation destruction of the gland. More recently, several drugs that inhibit thyroid activity have been discovered, and their use is replacing the former surgical procedures. T3 and T4 Function within the body[edit] File: PNG Iodine and T4 stimulate the spectacular apoptosis programmed cell death of the cells of the larval gills, tail and fins Transforming the aquatic, vegetarian tadpole into the terrestrial, carnivorous frog with better neurological, visuospatial, olfactory and cognitive abilities for hunting. Contrary to amphibian metamorphosis, thyroidectomy and hypothyroidism in mammals may be considered a sort of phylogenetic and metabolic regression to a former stage of reptilian life. Indeed, many disorders that seem to afflict hypothyroid humans have reptilian-like features, such as dry, hairless, scaly, cold skin and a general slowdown of metabolism, digestion, heart rate and nervous reflexes, with lethargic cerebration, hyperuricemia and hypothermia Venturi, They stimulate all cells within the body to work at a better metabolic rate. Their release will be increased under certain situations such as cold temperatures when a higher metabolism is needed to generate heat. When children are born with thyroid hormone deficiency they have problems with physical growth and developmental problems. Brain development can also be severely impaired The significance of iodine[edit] Thyroid hormone cannot be produced without an abundant source of iodine. When the thyroid is low on iodine the body will try harder to produce T3 and T4 which will often result in a swelling of the thyroid gland, resulting in a goiter. Extrathyroidal iodine[edit] Sequence of iodide human scintiscans after an intravenous injection, from left after 30 minutes, 20 hours, and 48 hours. A high and rapid concentration of radio-iodide is evident in the periencephalic and cerebrospinal fluid left , salivary glands, oral mucosa and the stomach. Highest iodide-concentration by the mammary gland is evident only in

pregnancy and lactation. High excretion of radio-iodide is observed in the urine. In the cells of these tissues iodide enters directly by sodium-iodide symporter NIS. Its role in mammary tissue is related to fetal and neonatal development, but its role in the other tissues is unknown. It has been shown to act as an antioxidant in these tissues. These higher recommended daily allowance levels of iodine seem necessary for optimal function of a number of body systems, including lactating breast, gastric mucosa, salivary glands, oral mucosa, thymus, epidermis, choroid plexus, etc. It is an additional hormone produced by the thyroid, and contributes to the regulation of blood calcium levels. Thyroid cells produce calcitonin in response to high calcium levels in the blood. This hormone will stimulate movement of calcium into the bone structure. It can also be used therapeutically for the treatment of hypercalcemia or osteoporosis. Without this hormone calcium will stay within the blood instead of moving into bones to keep them strong and growing. Its importance in humans has not been as well established as its importance in other animals.

Chapter 4 : Endocrine Society Journals | Oxford Academic

Endocrine cancer can affect the pituitary gland, thyroid gland, and pancreas. There are no clear risk factors for endocrine cancer, but there are some factors people have in common.

Amenorrhea is the absence of menstrual cycles. There are some reasons to stop having menstrual periods during the premenopausal years such as during pregnancy and the use of certain medications prescribed by healthcare providers. However, there are a number of medical conditions that can also cause amenorrhea in premenopausal women. For example, the athletic female triad is a syndrome consisting of disordered eating, excessive exercise, and amenorrhea that results in bone loss. Bone density is lower in athletes with amenorrhea in comparison to athletes with regular menstrual cycles. Some of the other common causes of amenorrhea include the use of certain medications and some medical conditions such as thyroid disease, polycystic ovarian syndrome, and pituitary disorders. How does amennorhea affect bone health? Amenorrhea that is not related to pregnancy can often lead to lower bone density, particularly if it is related to lower estrogen levels. In all cases, it is important to consult with a doctor or healthcare provider to determine the cause for amenorrhea. Early detection and treatment of disorders that can cause amenorrhea may help reduce the risk for osteoporosis. This overproduction of cortisol can produce the same problems for bones as that caused by the use of steroid medications. In Type 1 diabetes, the pancreas no longer makes insulin and therefore blood glucose cannot enter the cells to be used for energy. In Type 2 diabetes, either the pancreas does not make enough insulin or the body is not able to use insulin properly. How does Type 1 diabetes affect bone health? Type I diabetes appears to be a significant risk factor for osteoporosis. In Type 1 diabetics, the cells that form bone do not seem to work as well as those in the general population, perhaps due to the absence of the bone forming effects of insulin. This may be one of the reasons why low bone mass occurs. Further research is needed to better understand the complex relationship between Type 1 diabetes and osteoporosis. How does Type 2 diabetes affect bone health? People with Type 2 diabetes usually have normal or even increased bone mass compared with those without diabetics. The higher body weight typical of individuals with Type 2 diabetes may account for the normal or increased bone mass. However, evidence suggests that despite normal bone mass, people with Type 2 diabetes tend to have a higher risk for fracture than non-diabetics. Much of the increased risk for fracture is due to a higher risk for falls. To begin with, many women with Type 2 diabetes are overweight and inactive. These two factors tend to lessen coordination and balance making it more likely for a person to fall. People with Type 2 diabetes often have complications such as impaired vision, peripheral nerve damage, or foot problems, all of which can contribute to a fall. Finally, some people with Type 2 diabetes especially if their blood glucose is poorly controlled find that they frequently have to get out of bed during the night to use the bathroom. Walking around in the dark in a sleepy state, especially without proper lighting, can greatly increase the risk of falls. How can people with Type 1 and Type 2 diabetes protect their bones? There are many actions that individuals with diabetes can take to help protect their bones: It has been observed that bone loss is greater in people with poorly controlled diabetes than in those whose diabetes is in tight control. Therefore, keeping blood glucose levels close to normal is the first line of defense against osteoporosis, falls, and fractures. It is important for all people with diabetes to achieve and maintain a stable, ideal body weight. Physical activity is another important defense. It reduces bone loss, improves muscle strength and balance, and helps prevent falls. Other important strategies for strong bones include avoidance of smoking and limited consumption of alcoholic beverages. All individuals with diabetes should have routine visual assessment. It is of utmost importance to implement strategies for fall prevention. For example, some well-placed night lights can greatly help reduce the risk for falls during the night. If a patient is at increased risk for falling, it is important to speak to your healthcare provider about getting a referral to a physical therapist for a comprehensive falls evaluation and gait-training program. The parathyroid glands are four small endocrine glands the size of peas that are located at the base of the neck next to the thyroid gland. Although they are neighbors and both part of the endocrine system, the thyroid and parathyroid glands are otherwise not related. The parathyroid glands produce parathyroid hormone that is

largely responsible for maintaining normal levels of calcium in the blood. Hyperparathyroidism is overactivity of one or more of the parathyroid glands. In hyperparathyroidism, too much parathyroid hormone is produced. In primary hyperparathyroidism, excessive levels may be the result of a tumor that is usually benign. A surgical procedure to remove the benign tumor is often required. How does hyperparathyroidism affect bone health? Hyperparathyroidism can result in bone loss and higher calcium levels in the blood. Primary hyperparathyroidism may lead to a lower bone mass at some skeletal sites while bone mass at other skeletal sites will be preserved. A recent study found that there was an increased risk for fractures broken bones at the spine, forearm, and lower extremities in people with primary hyperparathyroidism. The increased fracture risk can happen more than several years before having surgery to remove the parathyroid gland. After parathyroid surgery, fracture risk stabilizes and there is no additional fracture risk associated with the disease. Often women with hyperprolactinemia experience a milky discharge from their breasts and amennorhea, the stopping of their menstrual periods. How does hyperprolactinemia affect bone health? Increased prolactin levels can lead to decreased bone density when compared with healthy individuals of the same age. Kleinfelter syndrome is the most common sex chromosome variation in males. The disease is caused by an extra X, or female, sex chromosome. The extra X chromosome interferes with the development of male characteristics. Men with Klinefelter syndrome often have low testosterone levels. Characteristics of Klinefelter syndrome vary from person to person. How does Klinefelter syndrome increase the risk for osteoporosis? The low testosterone levels associated with Klinefelter syndrome increase the risk for developing osteoporosis. The lower the testosterone level, the lower the bone density. Thyroid hormone is a hormone secreted into the bloodstream by the thyroid gland located in the front of the neck. It can affect heart rate, body weight, energy level, muscle strength, skin condition, mental state, intestinal function, bone health, and menstrual cycles in females. How does thyroid disease affect bone health? Too much thyroid hormone can increase bone loss and increase the risk for osteoporosis. There are different conditions that result in excess thyroid hormone: Hypothyroidism treated with excess thyroid medication- Hypothyroidism is a condition in which there is too little thyroid hormone. People with hypothyroidism commonly take thyroid medication to replace what their own glands are not making. In contrast, taking the correct amount of thyroid medication will not produce any adverse effects on bone. High doses of thyroid medication-. Some people are treated with high doses of thyroid medication to stop the growth of small benign tumors called nodules. It is important to have nodules checked and the dose of medication routinely assessed by a healthcare provider. In rare cases of thyroid cancer, large doses of thyroid medication may be necessary to prevent stimulation of the thyroid tissue. High doses of thyroid medication increase the risk for bone loss and osteoporosis. It is important to follow the advice of your healthcare provider in order to get treatment for your condition. How can people with thyroid disease protect their bones? Assess your risk for osteoporosis: The skeletal effects of thyroid disease vary based on gender, menopausal status, and other risk factors for osteoporosis. Get a BMD bone mineral density test when appropriate: Women who have conditions associated with excess thyroid hormone should get a bone density test as early as possible after menopause. It is important for men over age 50 with thyroid disease to consult with their healthcare provider to find out the appropriate time for a BMD test. Ask your healthcare provider about a routine TSH blood test- Anyone on thyroid medication should be sure to see their healthcare provider regularly and get a routine blood test called a TSH level as often as prescribed. This is necessary to make sure that the dose of thyroid medication is correct. It occurs when one of the two X chromosomes normally found in females is missing or incomplete. Almost all people with Turner syndrome have short stature and loss of ovarian function resulting in low estrogen levels. No real causes have been found for this condition. It appears to randomly occur and affects 1 out of females live births worldwide. How does Turner syndrome affect bone health? There is a high incidence of osteoporosis in women with Turner syndrome. The main cause of osteoporosis appears to be low levels of estrogen but there may also be defects in bone structure and strength. Children with Turner syndrome do not tend to have the increases in bone mass normally seen at puberty. Women with Turner syndrome tend to have lower bone mass than their peers.

Chapter 5 : The Endocrine and Respiratory System by syanne hines on Prezi

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Endocrine factors are undoubtedly at the heart of circadian biology. Not only is the generation, secretion, and abundance of various endocrine factors subjected to.

Chapter 6 : Negative Factors that Affect the Endocrine System

The endocrine glands of the body include the pituitary, thyroid, parathyroid, adrenal, pineal, and thymus glands. The pancreas, ovaries, and testes also act as endocrine glands. The endocrine system is a controlling system of the body.

Chapter 7 : Endocrine Cancer â€“ Risk Factors & Symptoms | Infirmary Cancer Care | Infirmary Cancer Ca

Many of the factors common to people with severe, chronic candidiasis are known to disrupt the body's endocrine system, resulting in hormonal abnormalities that, in turn, can be aggravated by antibiotics, and even by Candida itself.

Chapter 8 : Human Physiology/The endocrine system - Wikibooks, open books for an open world

*Whereas endocrine factors (hormones) travel through the blood to exert their effects, paracrine factors are secreted into the immediate spaces around the cell producing them. * These proteins are the "inducing factors" of the classic experimental embryologists.*

Chapter 9 : Neuroendocrine cell - Wikipedia

The endocrine system is a network of glands that produce and release hormones that help control many important body functions, including the body's ability to change calories into energy that.