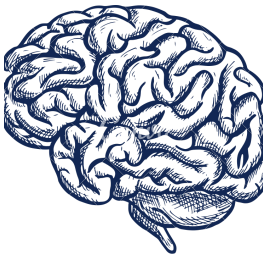


# ENDOCRINE DISORDERS

MARIANA MARQUES DA SILVA

# Summary

# Acknowledgments

This thanks goes to my doctors:

- Dr. Cezar Augusto de Oliveira and Dr. Simone Sakura Ito

To my parents:

- Rosana Aparecida Marques da Silva and Odair da Silva

To my supervisors:

- André Missfeld and Valquiria Kelly Zanrarini Braga

And, finally, to the Bom Jesus São José School

# Manual Cause

After creating a form sent to a group of people whose subject is Endocrine Diseases, 33 answers were obtained, where it was described that:

- 94% have some category of Endocrine Disease that had as a cause pituitary tumors, idiopathic, during pregnancy period, autoimmune, apparent, accidents.
- When telling a doctor about the situation, the doctor belittled it, as if it were a cold; he didn't know; he didn't know how to deal with the situation; he had no idea what it was about; he acted incredulously; and the patient himself must explain. Few doctors had knowledge, referred to neurosurgeons and endocrinologists; they treated it efficiently, even with difficult control.
- 97% concluded that, after going through certain situations, Endocrine Diseases should be researched more in Brazil.

That is why I am here, producing this manual.

google forms, 2020
https://docs.google.com/forms/d/14CPo6KHiqbAREk8SYSBFssmAx5vqkfUHs7rR5BW5oAQ/edit?usp=drivesdk&chromeless=1

# Endocrinology

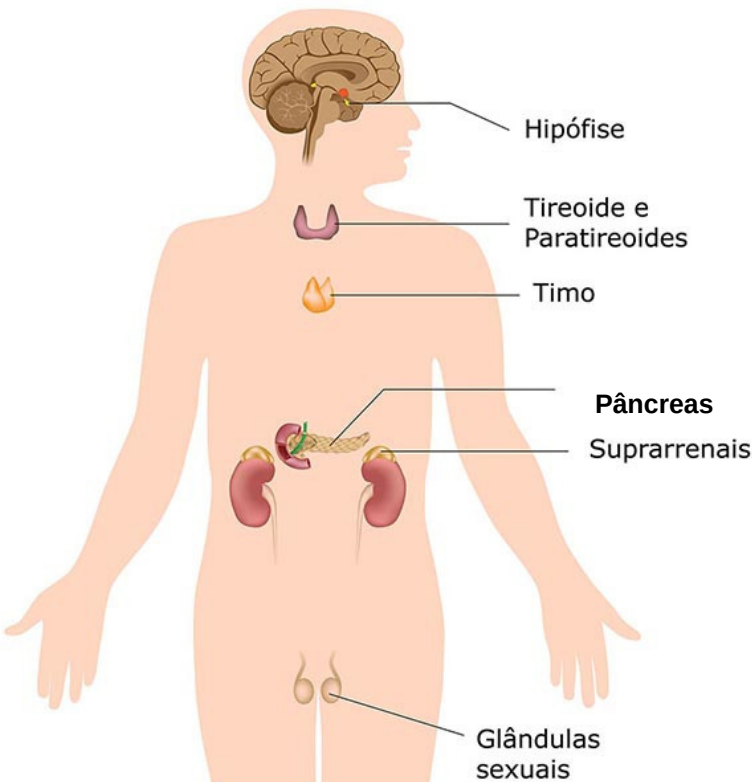
Endocrinology is the study of the Endocrine System, and the main areas of activity are: diabetes, obesity, thyroid diseases, pituitary disorders, menstrual disorders, among others. It has several branches of study, such as neuro endocrinology, thyroid, obesity and diabetes, adrenals, female and male endocrinology, carbohydrate, lipid and protein metabolism, neuroendocrine tumors and polyglandular syndromes (frequent combinations of diseases). It integrates endocrinology with medicine and lifestyle, with the goal of optimizing the individual's health through an approach focused on preventing diseases before they manifest. The specialty has been gaining projection over the years, because the disorders treated by it have been increasing their prevalence in the Brazilian population and in the world.

docctormed, 2020
https://docctormed.com.br/endocrinologia/

# The Endocrine System

Set of glands responsible for the production of hormones that are released into the blood and travel through the body until they reach the target organs that they act on. It coordinates all the functions of our body. The hypothalamus (nerve cells located at the base of the brain) makes the integration between these two systems. The endocrine glands are located in: the pituitary gland, the thyroid and parathyroid glands, the thymus, the adrenals, the pancreas, and the sex glands.

Toda Matéria, 2020
https://www.todamateria.com.br/sistema-endocrino/




Toda Matéria, 2020
https://www.todamateria.com.br/sistema-endocrino/#:~:text=O%20Sistema%20End%C3%B3crino%20%C3%A9%20o,as%20fun%C3%A7%C3%B5es%20do%20nosso%20corpo.

# The Hypophysis

A pea-sized gland located inside the sella turcica (located in the brain, protects the pituitary gland). It controls the function of the glands, so it is called the master gland. It is controlled by the hypothalamus (region of the brain above the pituitary gland). By the levels of hormones produced, the hypothalamus or pituitary determines how much stimulation the glands need. Each of these hormones affects a specific part of the body. Since the pituitary controls the function of most glands. Often with the presence of a benign tumor it can overproduce pituitary hormones, or put pressure on the cells and cause hormone deficiency and pituitary enlargement, with or without disturbance of hormone production. Sometimes there is production of more than one hormone by the pituitary tumor and a deficiency of production of another due to the pressure.

Toda Matéria, 2020
https://www.todamateria.com.br/sistema-endocrino/

# Acromegaly

A syndrome of excess GH (growth hormone) secretion resulting from pituitary tumors. The diagnosis is clinical, through x-rays of the skull and hands, and measurement of GH concentrations. Treatment involves removal or destruction of the tumor responsible. There are less than 15,000 cases per year.

- **Signs and Symptoms**

When GH hypersecretion (oversecretion) begins, initial manifestations are a thickening of the face and soft tissues on the hands and feet. In adults, body hair increases and the skin becomes thicker and darker. Jaw growth causes displacement of the chin and poor tooth closure. Joint symptoms are common, and cartilage may wear away. Galactorrhea (excessive secretion of milk) occurs in some women. However, galactorrhea can occur with an excess of GH alone, as GH stimulates lactation (milk production). About one third of men with acromegaly develop erectile dysfunction and virtually all women develop menstrual irregularities.

- **Drug Therapy**

Indicated if surgery and radiation therapy are contraindicated or if radiation therapy is still being administered. A GH receptor blocker, shown to reduce its effects and decrease concentrations in individuals with acromegaly with no apparent increase in pituitary tumor. This drug can be used for the treatment of patients who are partially or completely unresponsive to treatment

- **Diagnosis**

Made from characteristic clinical findings. CT, MRI, and skull radiographs reveal enlargement of the frontal sinuses, enlargement and erosion of the sella turcica. Hand radiographs show clumps on the terminal portions of the phalanx.

- **Treatment**

1. Surgery or radiation therapy
2. Pharmacological suppression of GH secretion or activity

- **Ablative Therapy**

Ablative treatment with surgery or radiation therapy is indicated, but the choices vary at different institutions. Proton accelerator treatment allows the delivery of higher doses of radiation to the pituitary gland, but this treatment carries a high risk of nerve and hypothalamic injury. A combined approach of surgery and radiation therapy is indicated for patients with pituitary tumor involvement and for those whose tumor cannot be completely resected (eliminated).

- **Drug Therapy**

Indicated if surgery and radiation therapy are contraindicated or if radiation therapy is still being administered. A GH receptor blocker, shown to reduce its effects and decrease concentrations in individuals with acromegaly with no apparent increase in pituitary tumor. This drug can be used to treat patients who are partially or completely unresponsive to treatment.

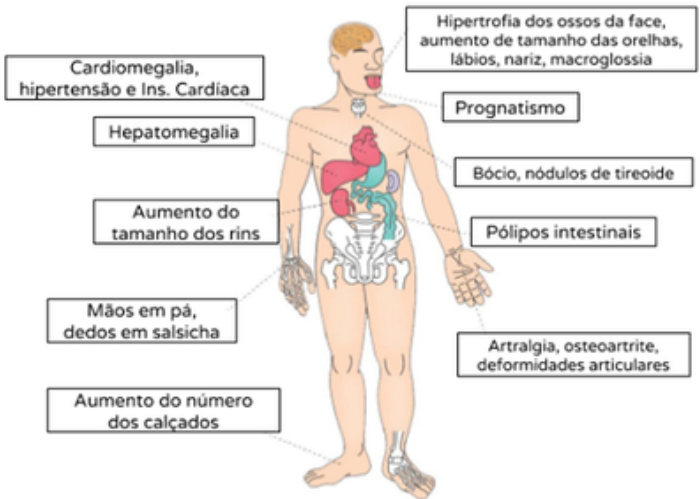
- **Key Points**

1. It is usually caused by a pituitary tumor that takes away excessive amounts of GH
2. Acromegaly involves hypersecretion of GH starting in adulthood; bone and soft tissue abnormalities develop.
3. Diagnose by measuring insulin and GH levels
4. Remove pituitary tumors surgically or use radiation therapy

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-hipofis%C3%A1rios/gigantismo-e-acromegalia

# ACROMEGALIA

Doença causada pelo excesso de Hormônio do Crescimento (GH) que acarreta disfunções em múltiplos órgãos e aumento da morbimortalidade especialmente por doenças cardiovasculares. Quando ocorre em crianças é chamada de Gigantismo por se associar com crescimento longitudinal excessivo. Estima-se que ocorra um atraso de 8-10 anos entre o início dos sintomas e o diagnóstico da acromegalia.




O médico deverá considerar a possibilidade de acromegalia caso o paciente apresente dois ou mais dos seguintes sintomas:*

- doença cardíaca
- síndrome do túnel carpal
- pólipos do cólon
- diabetes de início recente
- fadiga
- cefaleia
- hipertensão recente ou de difícil controle
- artralgias difusas
- perda de visão
- transpiração intensa
- desalinhamento progressivo da mandíbula
- apneia do sono

**1 de Novembro**
**Dia da Conscientização da Acromegalia**

Vivendo com, 2020
https://acromegalia.vivendocom.com.br/sobre-acromegalia/saiba-mais-sobre-acromegalia/sinais-e-sintomas-da-acromegalia/

# GH Deficiency in Children

GH deficiency is the most common growth hormone deficiency in children; it can be isolated or accompanied by deficiency of other hormones. Unlike many hormone deficiencies, GH levels are of little use in diagnosing growth hormone deficiency, which results in slow growth and short stature. Diagnosis involves measuring hormone levels. Treatment involves specific hormone replacement and/or removal of any causative tumor. Patients with growth hormone deficiency associated with hypopituitarism will also be deficient in more hormones.

- **Etiology**

GH deficiency can occur alone or in association with hypopituitarism (an endocrine disease characterized by decreased secretion of one or more of the eight hormones produced by the pituitary gland). In both cases, the deficiency can be acquired or congenital (born to the individual). Rarely, there is no GH deficiency, but the GH receptors are abnormal. Isolated GH deficiency occurs in 1/4,000 to 1/10,000 children. It is usually idiopathic (spontaneous), but they have an identifiable etiology. Congenital causes include abnormalities in the GH-releasing hormone receptor. Acquired causes include radiation therapy, meningitis, and brain damage (destruction of brain cells). Radiation therapy to the spine can further alter the potential growth of the vertebrae and further endanger height gain.

- **Signs and Symptoms**

It manifests as growth deficit with delayed tooth development. Despite the short stature, the child maintains normal proportionality between body segments. Other abnormalities may be present, such as weight gain disproportionate to growth, resulting in relative obesity.

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- **Diagnosis**

1. Clinical evaluation, including growth criteria and other medical history
2. Imaging examinations
3. Insulin-like growth factor and protein binding levels
4. Usually confirmation by stimulation tests
5. Evaluation of other pituitary hormones and other causes of low growth

Screening laboratory tests to look for other possible causes of growth deficits, including:

1. Hypothyroidism
2. Kidney disease
3. Inflammatory and immune conditions
4. Hematologic Diseases

- **Treatment**

1. GH Supplementation and Replacement of other pituitary hormone

GH treatment is indicated for all children with short stature who have documented growth hormone deficiency.

- **Key Points**

1. Growth hormone deficiency can occur singly or in association with generalized hypopituitarism.
2. Causes include congenital and some acquired diseases of the hypothalamus and/or pituitary gland.
3. GH deficiency causes short stature
4. Children with short stature and documented GH deficiency should receive GH

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/profissional/pediatria/dist%C3%BArbios-end%C3%B3crinos-em-crian%C3%A7as/defici%C3%AAncia-de-horm%C3%B4nio-do-crescimento-em-crian%C3%A7as
query=Baixa%20estatura%20em%20crian%C3%A7as

# Diabetes Insipidus

A disorder of water control in the body in which the kidneys cannot adequately retain the water that is filtered out. As a consequence, the patient starts to present an increase in the volume of urine, which easily exceeds 3 liters per day, and can reach more than 10 liters of urine. There are less than 15 thousand cases

It is divided into

- Central (antidiuretic hormone deficiency)
- Nephrogenic (inability to concentrate urine)
- Gestational (same as central, but during pregnancy)

## Causes

- Damage to the hypothalamus or pituitary gland due to surgery, infection, tumor or head trauma.
- Certain medications, e.g. lithium: the most common cause of diabetes insipidus.
- Nephropathy, polycystic kidney disease.
- Protein malnutrition.

## Signs and Symptoms

- Large urinary volumes above 3 liters.
- Intense thirst with preference for cold liquids.
- Very clear and diluted urine.
- Waking up during the night to go to the bathroom.
- Dehydration

## Diagnosis

Water deprivation test. In this test, the person's condition is monitored for 12 hours. At the end, the doctor stops the test and injects vasopressin. The diagnosis is confirmed if, in response to the vasopressin, the excessive urine output is stopped, the urine becomes more concentrated, the blood pressure rises, and the heart beats normally.

- **Treatment**

Usually treated with Desmopressin (synthetic drug very similar to human ADH). It has greater time of action, antidiuretic potency, and lower pressure effect when compared to ADH. The medication can be given orally, nasally, and intravenously. If the person does not use the medication correctly, he or she may eliminate large volumes of water that are essential for the body to function. Thus, the untreated complication is dehydration, which in more severe and acute cases can cause loss of consciousness, convulsion, kidney failure, and death.

- **Key Points**

1. It is caused by vasopressin deficiency, which decreases the kidneys' ability to reabsorb water, resulting in massive polyuria.
2. The cause can be genetic, tumors, infiltrative lesions, or infections
3. Patients cannot concentrate urine maximally after dehydration, but can concentrate urine after receiving exogenous vasopressin.
4. Low vasopressin levels are diagnostic, but they are difficult to measure and testing is not routinely available.
5. Address any treatable causes and give desmopressin, a synthetic analog of vasopressin.

MSD Manuals, 2020
https://www.msdmanuals.com/pt/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-hipofis%C3%A1rios/diabetes-ins%C3%ADpido-central

# Diabetes Mellitus

It is characterized by altered insulin secretion and varying degrees of peripheral insulin resistance, which causes hyperglycemia. Complications can be delayed or prevented with adequate glycemic control, heart disease remains the leading cause of mortality. There are 2 categories of diabetes mellitus that can be differentiated. The terms describing age of onset or treatment category are not accurate across age groups and across disease types. Overview of impaired glucose diabetes is a transitional intermediate state between glucose metabolism and diabetes mellitus, which becomes more common with aging. It is a significant risk factor and can be present for several years.

- **Complications**

They can affect small or large blood vessels. Microvascular disease (small vessels) alters the healing of the skin, which can become more easily infected. Blood glucose control can prevent many complications, but not reverse them if they have already become established. It is "hidden" from the 3 most common manifestations of diabetes mellitus:

- Retinopathy (retinal damage)
- Nephropathy (long-term metabolic change)
- Neuropathy (nerve disorder)

Macrovascular disease (large vessels) is a complication that develops from the direct effect of hyperglycemia on cellular immunity.


Wiselife, 2020
https://wiselife.pt/diabetes-mellitus/o-que-e-diabetes-mellitus/

- **Type 1 Diabetes**

No insulin is produced due to autoimmune destruction of the cells by environmental exposure. The destruction progresses over months or years, until the mass of cells decreases to the point that insulin concentrations are no longer adequate to control blood glucose. If it develops in children or adolescents, it can also occur in adults. Some cases do not appear to be autoimmune in nature and are considered idiopathic..

- **Type 2 Diabetes**

Insulin secretion is inadequate as patients have insulin resistance that leads to the inability to suppress glucose, peripheral insulin resistance impairs peripheral glucose uptake. Often, insulin levels are very high early in the disease. Later, insulin production drops. Usually developing in adults and becoming more common with age, glucose levels rise after eating high-carbohydrate meals. Glucose levels take longer to return to normal because of the accumulation of fat and muscle mass. It is becoming increasingly common in children as childhood obesity has become epidemic. There are genetic determinants evidenced by prevalence within ethnic groups and relatives with the disease.

- **Signs and Symptoms**

The most common are early mild hyperglycemia, which is asymptomatic (expresses no symptoms). The most significant increases in urinary frequency, which can cause weakness, fatigue, and altered mental status. Symptoms may come and go with fluctuating glucose levels. Type 1 patients have symptomatic hyperglycemia (expresses symptoms). Type 2 patients have symptomatic hyperglycemia, but are usually asymptomatic; their condition is detected during routine examinations. In some patients, the symptoms are those of diabetic complications, suggesting that the disease has been present for a long time. Individuals at high risk for type 1 DM can be screened for the presence of antibodies that is present from the onset of the clinical disease. However, there are no proven prevention strategies for high-risk individuals, so screening is usually reserved for research settings.

- **Treatment**

Treatment is done with lifestyle modifications and drugs. It involves controlling hyperglycemia to relieve symptoms and prevent complications, while minimizing episodes of hypoglycemia. Patients with hyperglycemia may respond better to treatment after glucose levels are normalized by a brief period of insulin treatment. Patients with impaired glucose tolerance should be counseled regarding their risk of developing diabetes mellitus and the importance of lifestyle changes in preventing the disease. They should be closely monitored for the development of symptoms of DM or elevated blood glucose. The optimal follow-up intervals have not yet been determined, but annual or biannual checks are likely to be appropriate.

- **Patient Orientation**

Educating the patient about the causes of DM, diet, physical activity, drugs, self-monitoring with point-of-care tests, signs and symptoms of hypoglycemia, hyperglycemia, and complications of DM is essential to optimize treatment. Formal education programs for diabetics, usually done by nurses and nutritionists, are usually very effective.

- **Type 1 Diabetes Prevention**

No treatment can definitively prevent onset or progression. However, the need for lifelong treatment limits its use. In some patients, treatment with monoclonal antibodies reduces insulin requirements at least in the first year of disease by suppressing the immune cell response. It can be prevented with lifestyle changes associated with moderate to intense physical activity and can reduce the incidence of DM by 50% in high-risk individuals.

- **Complications**

The risk of complications of diabetes can be reduced by strict control of blood glucose and by controlling hypertension and lipid levels complications

## Key Points

- Type 1 diabetes is caused by a lack of insulin due to autoimmune inflammation of the beta cells of the pancreatic islets.
- Type 2 diabetes is caused by hepatic insulin resistance, peripheral insulin resistance in combination with a defect in secretion of the beta cells of the pancreatic islets.
- Microvascular complications include nephropathy, neuropathy, and retinopathy.
- Macrovascular complications involve atherosclerosis resulting in coronary heart disease, stroke, and peripheral arterial insufficiency
- Regular screening for complications
- Treat with diet, physical activity, and insulin and/or oral antihyperglycemic drugs
- Usually give ACE inhibitors, statins, and acetylsalicylic acid to prevent complications

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/diabetes-melito-e-dist%C3%BArbios-do-metabolismo-de-carboidratos/diabetes-melito-dm?query=Diabetes%20mellitus%20(DM)

# Addison's Disease

It produces various symptoms and can cause adrenal crisis with cardiovascular collapse. Treatment depends on the cause, but is usually done with hydrocortisone and other hormones. It develops in about 4/100,000 annually. It occurs in all age groups in both sexes and tends to become apparent during metabolic stress or trauma. Other causes include trauma, surgery, and loss of sodium. Even with treatment, it can cause an increase in the mortality rate. It is unclear whether this increase is due to inadequately treated adrenal crisis or long-term complications. There are fewer than 150,000 cases per year.

- **Etiology**

About 70% of the cases in the USA are due to idiopathic atrophy caused by an autoimmune process. The remainder result from destruction of the adrenal glands by granuloma. It may coexist with DM or hypothyroidism. In children, the most common cause of primary adrenal insufficiency, but other genetic diseases are increasingly recognized as causes.

- **Pathophysiology: Mineralocorticoid deficiency**

They stimulate sodium reabsorption and potassium excretion, deficiency results in increased sodium excretion and decreased potassium excretion, primarily in urine, but also in sweat, saliva, and the gastrointestinal tract. The result is low sodium and high potassium concentrations.

- **Signs and Symptoms**

Weakness, fatigue, and orthostatic hypotension are early signs and symptoms. Hyperpigmentation is characterized by tanning of exposed and unexposed areas of the body, skin folds, scars, and extensor surfaces

Black freckles are common on the forehead, face, neck and shadows. Bluish-black pigmentation occurs on the areolas and mucous membranes of the lips, mouth, rectum and vagina. The gradual onset and non-specific nature of the symptoms often leads to diagnosis. There is usually anorexia, nausea, vomiting, and diarrhea. Decreased cold tolerance and hypometabolism can be observed.

- ## Diagnosis

1. Electrolytes and serum cortisol

Clinical signs and symptoms suggest adrenal insufficiency. Sometimes, the diagnosis is only considered on the discovery of characteristic abnormalities of serum electrolytes, including low sodium, high potassium, and elevated urea.

- ## Treatment

1. Hydrocortisone or prednisolone

Cortisol is secreted at its maximum level in the morning and minimum in the evening. Thus, hydrocortisone is given in 2 to 3 takes, the total daily topical dose being 15 to 30 mg. One regimen consists of administering half in the morning, and the remainder of the dose at lunch and early evening. Others administer two-thirds in the morning and one-third in the early evening. Doses just before bedtime should be avoided because they can cause insomnia.

- ## Key Points

1. Addison's disease is primary adrenal insufficiency.
2. Weakness, fatigue and hyperpigmentation are typical.
3. Low sodium level, high serum potassium, and high urea level.
4. Doses of hydrocortisone and fludrocortisone are given; doses should be increased during intercurrent disease.

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-adrenais/doen%C3%A7a-de-addison?query=Doen%C3%A7a%20de%20Addison

# Hypothyroidism

Alteration in the production of the thyroid, producing hormones in an insufficient manner. It is one of the most common endocrine diseases, interfering with the processes performed by the body and slowing down the metabolism. The hormones triodothyronine and thyroxine are produced at a lower level than the body needs, interfering with the functioning of the metabolism. It is this failure in the production of T3 and T4 that causes hypothyroidism. Considered a congenital disease, it can occur in people with close family members with the disease or who have already undergone surgical interventions to remove the thyroid. The low production of hormones by the thyroid can also be related to the increase in size of the thyroid and a consequence of the treatment, because the thyroid starts to decrease its natural production. It has more than 2 million cases per year.

The symptoms of hypothyroidism are related to the alteration in the metabolism and are noticed over the years and are the most common:

- Tiredness
- Discouragement
- Indisposition
- Muscle and joint aches
- Decreased concentration
- Feeling excessively cold
- Weight gain without apparent cause
- Alteration in heartbeat
- Dry skin, fragile and brittle nails

# Hipotireoidismo

**O QUE É**

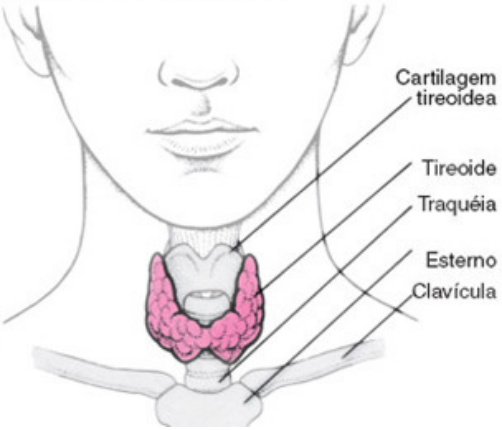
Disfunção na glândula tireoide, que passa a produzir menos hormônio tiroxina, que regula o metabolismo. Pode ser congênito, diagnosticado pelo teste do pezinho em recém-nascidos, ou atingir adultos, na maior parte vítimas da tireoidite de Hashimoto, que acontece quando os anticorpos atacam a glândula. A doença é mais comum em mulheres. A proporção é de seis mulheres para cada homem com hipotireoidismo.

**SINTOMAS**

- Aumento de peso
- Retenção de líquidos
- Queda de cabelo
- Voz arrastada
- Prisão de ventre
- Anemia
- Raciocínio lento
- Sonolência durante o dia

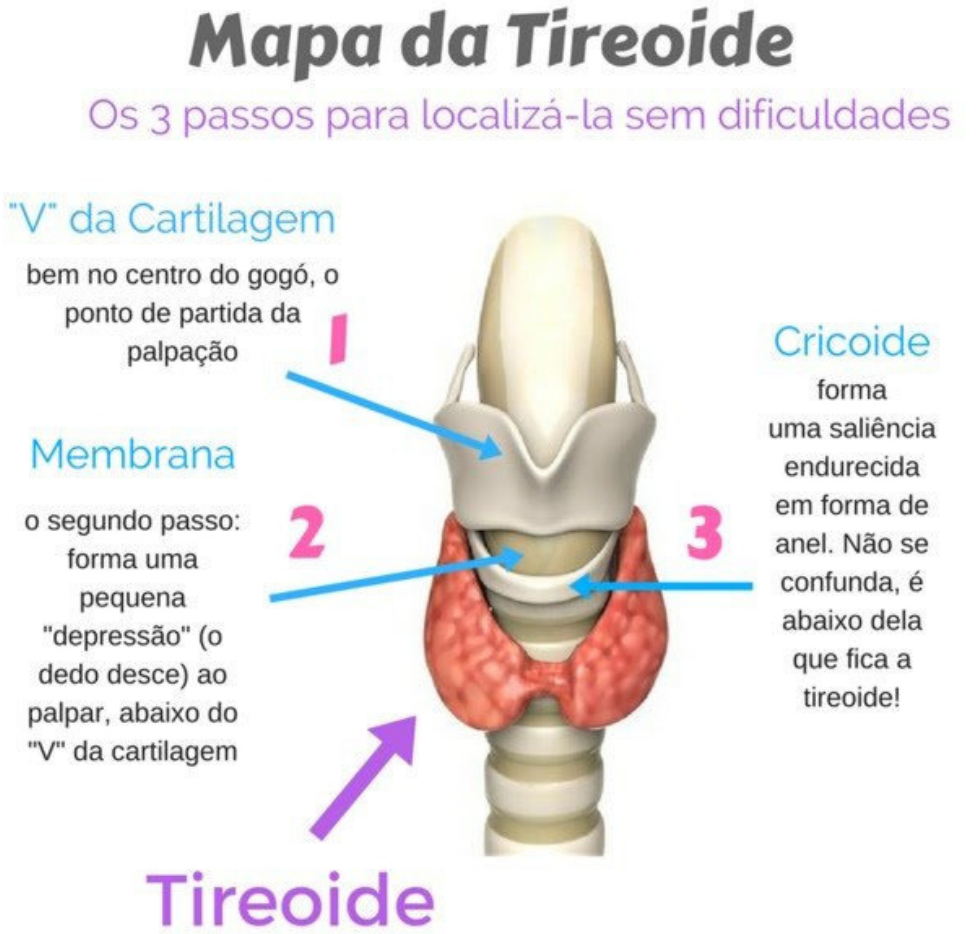
**TRATAMENTO**

A levotiroxina sódica substitui o hormônio com sucesso. É preciso consultar um médico para ajustar as doses, que são diferentes de pessoa para pessoa.




Toda Matéria, 2020
https://www.google.com/amp/s/www.todamateria.com.br/hipotireoidismo/amp/

Hypothyroidism can be diagnosed by physical examination, laboratory tests and ultrasound. The physical exam consists of a manual examination performed by the doctor who palpates the neck region and analyzes it for swelling and changes in shape. Unlike hyperthyroidism, hypothyroidism does not usually have visual changes. The laboratory test is the performance of blood tests to detect the dosages of the T3, T4, and TSH hormones. TSH is the thyroid stimulating hormone, which is produced by the pituitary gland. An antibody test can also be performed to find out if the thyroid gland already has changes or is going to develop them. The ultrasound is done to identify possible nodules felt during palpation.




Veja Abril, 2020
https://www.google.com/amp/s/veja.abril.com.br/saude/hipotireoidismo-nao-impede-a-pratica-de-esportes/amp/

The treatment for hypothyroidism consists of hormone replacement, which must be done according to each patient. The intake of T4, which is absorbed by the body and transformed into T3 by the body, is recommended. The adjustment of the hormone dose must be done on a regular basis, with medical monitoring, which checks the need to increase or decrease the intake of T4.

Toda Matéria, 2020
https://www.todamateria.com.br/hipertireoidismo/?_gl=1*1yp2ja2*_ga*YW1wLW52Wi1zRWk2U205TWFCLXJHM05mQnQ1Mmp6elBna3VvX3NiWHpldEExbzRRMzYzUV80SDZua283TnNIM09qWnY.

# Hyperthyroidism

Thyroid overactivity that leads to an overproduction of thyroid hormones, and is most common in women between the ages of 20 and 40. When left untreated, it can cause serious health problems, such as tachycardia, congestive heart failure, and osteoporosis. It has over 150,000 cases per year the symptoms are:

- Goiter (enlargement of the thyroid)
- Sensation of heat
- Sweating
- Loss of muscle strength
- Hand tremor
- Tachycardia
- Fatigue
- Weight loss
- Diarrhea or frequent bowel movements
- Irritability and anxiety
- Irritation or discomfort in the eyes
- Irregular menstrual cycle
- Infertility

The most common cause is Graves' disease, which occurs due to an attack by the immune system on the gland, causing it to increase in size and stimulating the gland to overproduce hormones; it is a chronic disease and affects people with a family history of teroid disease. Some individuals develop a swelling behind the eyes, which leads to the eyes protruding out of the eyeball.

- Lymphocytic thyroiditis (non-painful inflammation caused by infiltration of lymphocytes in the thyroid)
- Post-partum thyroiditis, which develops soon after the end of pregnancy.

Hyperthyroidism is curable. Treatment depends on the cause, the age and physical condition of the patient, and also the severity of the thyroid problem. Treatment options include:

- Antithyroid drugs: Drugs that reduce the amount of hormone produced by the thyroid;
- Radioactive iodine: Although it cures hyperthyroidism, it can lead to permanent destruction of the thyroid gland. In these cases, there is likely to be a need to take thyroid hormone tablets for the rest of your life to maintain normal hormone levels;
- Surgery: This involves the surgical removal of the thyroid (thyroidectomy). However, it can cause damage to the parathyroid glands and the nerves of the larynx. Therefore, it is usually recommended when medication or radioactive iodine therapy is not appropriate;
- Beta-blockers: These drugs do not decrease thyroid hormone levels, but are able to control severe symptoms such as tachycardia, tremors and anxiety.

Toda Matéria, 2020
https://www.todamateria.com.br/hipotireoidismo/

# Hypopituitarism

Decreased activity of the pituitary gland resulting in a deficiency of hormones. It is an uncommon disease. It can be caused by a number of factors, including certain inflammatory disorders, a pituitary tumor, or an insufficient blood supply to the pituitary gland.

- Symptoms of hypopituitarism depend on which hormone is deficient and can include short stature, infertility, cold intolerance, fatigue, and inability to produce breast milk.
- Diagnosis is based on measuring the levels in the blood of hormones produced by the pituitary gland and on diagnostic imaging tests performed on the pituitary gland.
- Treatment aims to replace the deficient hormones with synthetic ones, but sometimes includes surgical removal or irradiation of any pituitary tumors.

The symptoms depend on which pituitary hormones are deficient. Although sometimes the symptoms start suddenly and surprisingly, they often start gradually and can go unnoticed for a long time. The symptoms depend on which pituitary hormones are deficient. In some cases, the pituitary gland's production of a single hormone decreases. More specifically, the levels of several hormones decrease simultaneously. Production of growth hormone, luteinizing hormone, and follicle-stimulating hormone often decreases before thyroid-stimulating hormone and adrenocorticotrophic hormone.

- **Hormone Replacement**

Treatment also focuses on replacing deficient hormones, usually by replacing their target hormones.

Growth hormone is the only pituitary hormone that is replaced. Growth hormone treatment must be given by injection. When given to children with growth hormone deficiency before the growth plates in their bones have closed, growth hormone replacement prevents them from having unusually short stature.

Growth hormone is now also used to treat some adults with growth hormone deficiency to improve body structure, increase bone density, and improve quality of life.

- **Treatment of the Cause**

When the cause of pituitary hormone deficiency is a tumor, surgical removal of a tumor is often the most appropriate first treatment. Usually, removal of the tumor also reduces pressure-related symptoms and vision problems caused by the tumor. All but larger tumors can be surgically extracted through the nose. Larger tumors and those that extend beyond the bony structure at the base of the brain where the pituitary gland is located may be impossible to remove by surgery alone. Tumors that produce prolactin can be treated with drugs that act like dopamine, such as bromocriptine or cabergoline. These drugs reduce the size of the tumor while decreasing prolactin levels.

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/casa/dist%C3%BArbios-hormonais-e-metab%C3%B3licos/dist%C3%BArbios-da-hip%C3%B3fise/hipopituitarismo

# Precocious Puberty

Onset of sexual maturation before the age of 8 years in girls and 9 years in boys. Diagnosis is made by comparison with population standards, radiography of the left hand and wrist to assess bone age and check for progression of bone development, and evaluation of serum levels of gonadotropins and gonadal and adrenal steroids. In girls, the first pubertal event is breast development, soon to be followed by the appearance of hair, and later, the first menstrual period. In boys, the first milestone is the increase in testicular volume, followed by penile enlargement and the appearance of hair. The definition of precocious puberty depends on reliable population standards for the onset of puberty. It has fewer than 150,000 cases per year.

- **Signs and Symptoms**

In girls, breasts develop and hair appears, and they may start menstruating. In boys, hair and penile enlargement appear, with or without increased testicular volume, depending on the etiology. Body odor, acne, and behavioral changes can develop in both sexes. Pubertal growth spurt is seen in both sexes. The increase in testicular or ovarian volume that occurs in early puberty is absent in isolated early adrenarche.

- **Diagnosis**

Radiographs of the left hand and wrist assess bone maturation and analyze growth acceleration. If the history and examination do not suggest any abnormality, further evaluation is not necessary for those children whose pubertal milestones differ by 1 year from population standards. Boys and girls with isolated early adrenarche and girls with early telarche, without accelerated bone age, may also waive further evaluation.

- **Treatment**

If pubertal events are within 1 year of population standards, routine re-examinations are sufficient. Treatment is not necessary, but routine re-examination is important to prevent the possibility of future precocious puberty. Response to treatment should be monitored, and doses modified if necessary. Treatment can be continued until age 11 in girls and until age 12 in boys. If the GnRH-independent precocious puberty is due to a hormone-secreting tumor, the tumor should be removed.

## Key Points

- Early puberty is the onset of sexual maturation before age 8 in girls or age 9 in boys; but in recent years, puberty begins earlier, and traditional patterns are being reevaluated.
- Most commonly, secondary sexual characteristics develop prematurely because the hypothalamic-pituitary axis is activated (GnRH-dependent precocious puberty); often the cause is idiopathic.
- Less commonly, the cause is high circulating levels of estrogens or androgens (GnRH-independent precocious puberty) caused by congenital adrenal hyperplasia or various gonadal tumors.

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/profissional/pediatria/dist%C3%BArbios-end%C3%B3crinos-em-crian%C3%A7as/puberdade-precoce

# Cushing Syndrome

Constellation of clinical abnormalities caused by elevated concentrations of cortisol or related corticosteroids. Typical signs and symptoms include moon face and obesity of the trunk, easy bruising, thin legs and arms. Diagnosis is made by history of corticosteroid use or elevated serum cortisol concentrations. Treatment depends on the cause. It has fewer than 150,000 cases per year.

- **Etiology**

ACTH-dependent hyperfunction (polypeptide, type of protein) can result from:

- Pituitary hypersecretion of ACTH
- ACTH secretion by a non-pituitary tumor
- Administration of exogenous ACTH

ACTH-independent hyperfunction results from therapeutic administration of corticosteroids or from adrenal adenomas or carcinomas. Rare causes include primary nodular pigmented adrenal dysplasia and macronodular dysplasia. Patients with Cushing's disease usually have a small adenoma in the pituitary gland.

## Signs and Symptoms

- Moon-like face with a plethoric appearance
- Obesity of the trunk with prominent supraclavicular and dorsal cervical fat pockets, very thin fingers and distal extremities

- **Diagnosis**

1. Urinary free cortisol concentration
2. Dexamethasone suppression test
3. Serum or salivary cortisol levels at midnight
4. Serum ACTH levels

Diagnostic suspicion is based on characteristic clinical signs and symptoms. Confirmation usually requires hormonal and imaging tests.

- **Treatment**

1. High protein intake and potassium administration (or potassium-sparing drugs such as spironolactone)
2. Adrenal inhibitors such as methyrapone, mitotane, or ketoconazole
3. Surgery or radiation therapy to remove pituitary, adrenal, or ectopic ACTH-producing tumors.
4. Sometimes somatostatin analogues, dopamine agonists or mifepristone. Initially, the patient's general condition should be maintained by a high-protein diet and adequate potassium administration. If the clinical manifestations are severe, it may be reasonable to block corticosteroid secretion with methyrapone or ketoconazole, increasing to a maximum dose of 400 mg, 3 times/day. Ketoconazole probably has a slower onset of action.

## Key Points

- Diagnosis is usually made by elevated serum or nighttime salivary cortisol levels, or 24-h urinary free cortisol, and a dexamethasone suppression test.
- Pituitary causes are distinguished from non-pituitary causes by ACTH levels.
- Imaging testing is then done to identify any causative tumors.
- Tumors are usually treated surgically or with radiation therapy.
- Metirapone or ketoconazole may be administered to suppress cortisol secretion before definitive treatment.

MSD Manuals, 2020
https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-adrenais/s%C3%ADndrome-de-cushing

- **Thyroid**

Considering the pandemic and the demand for reliable information by patients and families with thyroid diseases, guidelines on thyroid x coronavirus were made available.

- Patients with thyroid diseases should follow the same guidelines as the Ministry of Health, emphasizing the need to maintain control of both hypothyroidism and hyperthyroidism. If necessary, seek the help of an endocrinologist for the necessary updates.
- Patients with thyroid diseases are not part of the risk group for infection, even if the cause of the disorder is autoimmune in nature. Only if these conditions are decompensated or untreated is it necessary to see a doctor.
- The treatment of hypothyroidism and hyperthyroidism should not change in the event of infection. It is recommended that patients maintain the use of their medications and update the measures as directed by their doctor.
- In cases of greater severity, it is important that the responsible medical team is informed about the treatment used, with the name and doses of the drugs being used.
- Regarding patients with Thyroid Cancer, most are not in the risk group for the severity of the infection and do not need any additional care regarding the protective measures against infection, beyond the guidelines of the Ministry of Health and other competent authorities previously disclosed to the population.

- Pacientes com Câncer de Tireoide avançado, especialmente aos pulmões, ou em uso de medicamentos específicos podem apresentar maior risco para a gravidade da infecção, tanto pela extensão da doença quanto pelos possíveis efeitos adversos dos medicamentos. Esses pacientes devem tomar mais cuidado. É recomendável que entrem em contato com seu médico para uma orientação individualizada.
- Neste momento, é importante mantermos a calma, a serenidade e o otimismo. Projetos de vida devem ser mantidos, embora temporariamente adiados. Estaremos mais seguros se seguirmos as orientações das autoridades e profissionais da saúde. Estabeleçam rotinas diárias em casa, mantenham atividade física mínima, alimentação saudável e evitem bebidas alcoólicas.

Endócrino.org, 2020
https://www.endocrino.org.br/diabetes-e-pandemia-de-covid-19/

- **Diabetes Mellitus**

Pessoas com diabetes não parecem apresentar risco aumentado de contrair o novo coronavírus. Entretanto, uma vez infectado, quem tem diabetes tem mais chance de complicações graves de COVID-19, incluindo maior risco de morte. O risco de agravamento de COVID-19 está aumentado tanto para o tipo quanto para o tipo 2. Contudo, o bom controle da glicose pode atenuar o risco de complicações na pessoa com diabetes. Assim, o risco de agravamento relaciona-se a maior idade e tempo de duração da doença, estado do controle metabólico, presença de doenças como hipertensão arterial e complicações do diabetes, especialmente doença renal, pode causar insuficiência renal independentemente de diabetes. Vale ressaltar que pessoas com DM1 podem ter outras doenças imunossupressoras que adiciona um estado de maior comprometimento imunológico.

Endócrino.org, 2020
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- **Acromegaly**

https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-hipofis%C3%A1rios/gigantismo-e-acromegalia

- **GH Deficiency in Children**

https://www.msdmanuals.com/pt-br/profissional/pediatria/dist%C3%BArbios-end%C3%B3crinos-em-crian%C3%A7as/defici%C3%AAncia-de-horm%C3%B4nio-do-crescimento-em-crian%C3%A7as?query=Baixa%20estatura%20em%20crian%C3%A7as

- **Diabetes Insipidus**

https://www.msdmanuals.com/pt/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-hipofis%C3%A1rios/diabetes-ins%C3%ADpido-central

- **Diabetes Mellitus**

https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/diabetes-melito-e-dist%C3%BArbios-do-metabolismo-de-carboidratos/diabetes-melito-dm?query=Diabetes%20mellitus%20(DM)

- **Addison's Disease**

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- **Hypothyroidism**

https://www.todamateria.com.br/hipotireoidismo/

- **Hypopituitarism**

https://www.msdmanuals.com/pt-br/casa/dist%C3%BArbios-hormonais-e-metab%C3%B3licos/dist%C3%BArbios-da-hip%C3%B3fise/hipopituitarismo

- **Precocious Puberty**

https://www.msdmanuals.com/pt-br/profissional/pediatria/dist%C3%BArbios-end%C3%B3crinos-em-crian%C3%A7as/puberdade-precoce

- **Cushing Syndrome**

https://www.msdmanuals.com/pt-br/profissional/dist%C3%BArbios-end%C3%B3crinos-e-metab%C3%B3licos/dist%C3%BArbios-adrenais/s%C3%ADndrome-de-cushing

- **Coronavirus**

https://www.endocrino.org.br/diabetes-e-pandemia-de-covid-19/
https://www.endocrino.org.br/esclarecimentos-do-departamento-de-tireoide-sobre-covid-19/